Environment Master Plan
Infrastructure Sector
(Environment & Social Guidelines)

Government of Himachal Pradesh

Department of Environment, Science & Technology

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Chapter 1: Introduction

Introduction: Develop Sectoral Guidelines: These would aim to ensure that sectoral development has minimal adverse environment impacts, and would typically include the following:

- Typical environment issues for each sector and an impact matrix.
- Guidance on carrying out Environment Assessments (EAs),
- Terms of Reference (ToR) for carrying out Environment Assessments (EAs)
- Good practice examples to illustrate innovative solutions for identified issues while balancing economic, social and ecological considerations

Typical environment issues for each sector and an impact matrix.

Predicated on baseline data, environment and social issues have been identified. The identified issues, causes and impacts/risk have been addressed in the Sectoral guidelines by way of proposed actions, type of response and inter-sectoral responsibilities.

Guidance on carrying out Environment Assessments (EAs)

The Environment Impact Assessment in India is being done as per Environment Impact Assessment (EIA) notification, 2006 and subsequent amendments namely 1. SO 1737(E), dated the 11th October, 2007, 2. SO 3067 (E), dated the 1st December, 2009, 3. SO 695 (E), dated the 4th April, 2011, 4. SO 2896 (E) dated the 13th December 2012 and 5. SO 674 (E), dated the 13th March, 2013 and 6. amendment dated August 22, 2013 [File no. 21-270/2008-IA.III].

Stages in the Prior Environmental Clearance (EC) Process for New Projects and Activities as per EIA notification, 2006 (and subsequent amendments) are described below:

The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall hereinafter referred to be as the Central Government in the Ministry of Environment and Forests for matters falling under Category 'A' in the Schedule and at State level the State Environment Impact Assessment Authority (SEIAA) for matters falling under Category 'B' in the said Schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

(i) All new projects or activities listed in the Schedule to this notification;
(ii) Expansion and modernization of existing projects or activities listed in the Schedule to this notification with addition of capacity beyond the limits specified for the concerned sector, that is, projects or activities which cross the threshold limits given in the Schedule, after expansion or modernization;
(iii) Any change in product - mix in an existing manufacturing unit included in Schedule beyond the specified range.

Categorization of projects and activities:-
(i) All projects and activities are broadly categorized in to two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources.
(ii) All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;
(iii) All projects or activities included as Category 'B' in the Schedule, including

expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification. In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project shall be treated as a Category 'A' project;

Screening, Scoping and Appraisal Committees:-

The same Expert Appraisal Committees (EACs) at the Central Government and SEACs (hereinafter referred to as the (EAC) and (SEAC) at the State or the Union territory level shall screen, scope and appraise projects or activities in Category 'A' and Category 'B' respectively. EAC and SEAC's shall meet at least once every month.

(a) The composition of the EAC shall be as given in Appendix VI. The SEAC at the State or the Union territory level shall be constituted by the Central Government in consultation with the concerned State Government or the Union territory Administration with identical composition;
(b) The Central Government may, with the prior concurrence of the concerned State Governments or the Union territory Administrations, constitutes one SEAC for more than one State or Union territory for reasons of administrative convenience and cost;
(c) The EAC and SEAC shall be reconstituted after every three years;
(d) The authorised members of the EAC and SEAC, concerned, may inspect any site(s) connected with the project or activity in respect of which the prior environmental clearance is sought, for the purposes of screening or scoping or appraisal, with prior notice of at least seven days to the applicant, who shall provide necessary facilities for the inspection;
(e) The EAC and SEACs shall function on the principle of collective responsibility. The Chairperson shall endeavour to reach a consensus in each case, and if consensus cannot be reached, the view of the majority shall prevail.

Application for Prior Environmental Clearance (EC):-

An application seeking prior environmental clearance in all cases shall be made in the prescribed Form 1 annexed herewith and Supplementary Form 1A, if applicable, as given in Appendix II, after the identification of prospective site(s) for the project and/or activities to which the application relates, before commencing any construction activity, or preparation of land, at the site by the applicant. The applicant shall furnish, along with the application, a copy of the pre-feasibility project report except that, in case of construction projects or activities (item 8 of the Schedule) in addition to Form 1 and the Supplementary Form 1A, a copy of the conceptual plan shall be provided, instead of the pre-feasibility report.

Stages in the Prior Environmental Clearance (EC) Process for New Projects:-

The environmental clearance process for new projects will comprise of a maximum of four stages, all of which may not apply to particular cases as set forth below in this notification.

These four stages in sequential order are:-

Stage (1) Screening (Only for Category 'B' projects and activities)
Stage (2) Scoping
Stage (3) Public Consultation
Stage (4) Appraisal

I. Stage (1) - Screening:

In case of Category 'B' projects or activities, this stage will entail the scrutiny of an application seeking prior environmental clearance made in Form 1 by the concerned State level Expert Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending up on the nature and location specificity of the project . The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. For categorization of projects into B1 or B2 except item 8 (b), the Ministry of Environment and Forests shall issue appropriate guidelines from time to time.

II. Stage (2) - Scoping:

" Scoping" refers to the process by which the Expert Appraisal Committee in the case of Category A projects activities, and State Expert Appraisal Committee in the case of category 'B1' projects or activities, including applications for expansion or modernization or change in product max of existing projects or activities, determine detailed and comprehensive Terms of Reference (TOR) addressing all relevant environmental concerns for the preparation of activity for which prior environment (EIA) Report in respect of the project or activity for which prior environmental clearance is sought and the Expert Appraisal Committee or State level Expert Appraisal Committee concerned shall determine the terms of reference on the basis of the information furnished in the prescribed application Form 1 or Form 1A including terms of reference proposed by the applicant, site visit by a sub- group of Expert Appraisal Committee or State level Expert Appraisal Committee concerned only if considered necessary by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned, terms of reference suggested by the applicant if furnished and other information that may be available with the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned:
Provided that the following shall not require Scoping

all project and activities listed as Category 'B' in item 8 of the Schedule (Construction or Township or Commercial Complexes or Housing) all Highway expansion projects covered under entry (ii) of column (3) and column (4) under sub-item (f) of item 7 of the Schedule:

Provided further that-

the projects and activities referred to in clause (i) shall be appraised on the basis of Form I or Form IA and the conceptual plan;
The projects referred to in clause (i) shall prepare EIA and EMP report on the basis of model TOR specified by Ministry of Environment and Forests;

(ii) The Terms of Reference (TOR) shall be conveyed to the applicant by the Expert Appraisal Committee or State Level Expert Appraisal Committee as concerned within sixty days of the receipt of Form 1. In the case of Category A Hydroelectric projects Item 1(c) (i) of the Schedule the Terms of Reference shall be conveyed along with the clearance for pre-construction activities .If the Terms of Reference are not finalized and conveyed to the applicant within sixty days of the receipt of Form 1, the Terms of Reference suggested by the applicant shall be deemed as the final Terms of Reference approved for the EIA studies. The approved Terms of Reference shall be displayed on the website of the Ministry of Environment and Forests and the concerned State Level Environment Impact Assessment Authority.

(iii) Applications for prior environmental clearance may be rejected by the regulatory authority concerned on the recommendation

of the EAC or SEAC concerned at this stage itself. In case of such rejection, the decision together with reasons for the same shall be communicated to the applicant in writing within sixty days of the receipt of the application.

III. Stage (3) - Public Consultation:

(i) "Public Consultation" refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. All Category 'A' and Category B1 projects or activities shall undertake Public Consultation, except the following:-

(a) Modernization of irrigation projects (item 1(c) (ii) of the Schedule).
(b) All projects or activities located within industrial estates or parks (item 7(c) of the Schedule) approved by the concerned authorities, and which are not disallowed in such approvals.
(c) Expansion of Roads and Highways (item 7 (f) of the Schedule) which do not involve any further acquisition of land.
(d) All Building /Construction projects/Area Development projects and Townships (item 8).
(e) All Category 'B2' projects and activities.
(f) All projects or activities concerning national defence and security or involving other strategic considerations as determined by the Central Government.

(ii) The Public C onsultation shall ordinarily have two components comprising of:-

(a) A public hearing at the site or in its close proximity- district wise, to be carried out in the manner prescribed in Appendix IV, for ascertaining concerns of local affected persons;
(b) Obtain responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project or activity.

(iii) the public hearing at, or in close proximity to, the site(s) in all cases shall be conducted by the State Pollution Control Board (SPCB) or the Union territory Pollution Control Committee (UTPCC) concerned in the specified manner and forward the proceedings to the regulatory authority concerned within 45 (forty five) of a request to the effect from the applicant.

(iv) in case the State Pollution Control Board or the Union territory Pollution Control Committee concerned does not undertake and complete the public hearing within the specified period, and/or does not convey the proceedings of the public hearing within the prescribed period directly to the regulatory authority concerned as above, the regulatory authority shall engage another public agency or authority which is not subordinate to the regulatory authority, to complete the process within a further period of forty five days.

(v) If the public agency or authority nominated under the sub paragraph (iii) above reports to the regulatory authority concerned that owing to the local situation, it is not possible to conduct the public hearing in a manner which will enable the views of the concerned local persons to be freely expressed, it shall report the facts in detail to the concerned regulatory authority, which may, after due consideration of the report and other reliable information that it may have, decide that the public consultation in the case need not include the public hearing.

(vi) For obtaining responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project or activity, the concerned regulatory authority and the State Pollution Control Board (SPCB) or the Union territory Pollution

Control Committee (UTPCC) shall invite responses from such concerned persons by placing on their website the Summary EIA report prepared in the format given in Appendix IIIA by the applicant along with a copy of the application in the prescribed form , within seven days of the receipt of a written request for arranging the public hearing. Confidential information including non-disclosable or legally privileged information involving Intellectual Property Right, source specified in the application shall not be placed on the web site. The regulatory authority concerned may also use other appropriate media for ensuring wide publicity about the project or activity. The regulatory authority shall, however, make available on a written request from any concerned person the Draft EIA report for inspection at a notified place during normal office hours till the date of the public hearing. All the responses received as part of this public consultation process shall be forwarded to the applicant through the quickest available means.

(vii) After completion of the public consultation, the applicant shall address all the material environmental concerns expressed during this process, and make appropriate changes in the draft EIA and EMP. The final EIA report, so prepared, shall be submitted by the applicant to the concerned regulatory authority for appraisal. The applicant may alternatively submit a supplementary report to draft EIA and EMP addressing all the concerns expressed during the public consultation.

IV. Stage (4) - Appraisal:

(i) Appraisal means the detailed scrutiny by the Expert Appraisal Committee or State Level Expert Appraisal Committee of the application and other documents like the Final EIA report, outcome of the public consultations including public hearing proceedings, submitted by the applicant to the regulatory authority concerned for grant of environmental clearance. This appraisal shall be made by Expert Appraisal Committee or State Level Expert Appraisal Committee concerned in a transparent manner in a proceeding to which the applicant shall be invited for furnishing necessary clarifications in person or through an authorized representative. On conclusion of this proceeding, the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned shall make categorical recommendations to the regulatory authority concerned either for grant of prior environmental clearance on stipulated terms and conditions, or rejection of the application for prior environmental clearance, together with reasons for the same.

(ii) The appraisal of all projects or activities which are not required to undergo public consultation, or submit an Environment Impact Assessment report, shall be carried out on the basis of the prescribed application Form 1 and Form 1A as applicable, any other relevant validated information available and the site visit wherever the same is considered as necessary by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned.

(iii) The appraisal of an application be shall be completed by the Expert Appraisal Committee or State Level Expert Appraisal Committee concerned within sixty days of the receipt of the final Environment Impact Assessment report and other documents or the receipt of Form 1 and Form 1 A, where public consultation is not necessary and the recommendations of the Expert Appraisal Committee or State Level Expert Appraisal Committee shall be placed before the competent authority for a final decision within the next fifteen days.

Prior Environmental Clearance (EC) process for Expansion or Modernization or Change of product mix in existing projects:

All applications seeking prior environmental clearance for expansion with increase in the production capacity beyond the capacity for which prior environmental clearance has been granted under this notification or with increase in either lease area or production capacity in

the case of mining projects or for the modernization of an existing unit with increase in the total production capacity beyond the threshold limit prescribed in the Schedule to this notification through change in process and or technology or involving a change in the product –mix shall be made in Form I and they shall be considered by the concerned Expert Appraisal Committee or State Level Expert Appraisal Committee within sixty days, who will decide on the due diligence necessary including preparation of EIA and public consultations and the application shall be appraised accordingly for grant of environmental clearance.

Analysis of Sectors, Sub-Sectors and departments identified for preparation of Environment Master Plan of Himachal Pradesh in relation to projects or activities requiring prior environmental clearance as identified in the EIA Notification 2006, under Environment Protection Act, 1986, MoEF, Government of India is given below in table. The specific recommendations and activities for engaging with public and other stakeholders related to sectors/ subsectors and which do not require public hearing as per EIA notification is given below in table. For sectors/ subsectors as identified for Environment Master Plan, which do not require public hearing as per EIA notification, progressive levels of Public Participation can be followed to engage with public and consult with stakeholders at large. These could also be dovetailed in the existing mechanism of public hearing for projects/ activities as mandated b y EIA notification.

Analysis of Sectors and Sub-Sectors identified for Environment Master Plan of Himachal Pradesh in relation to projects or activities requiring prior environmental clearance and public hearing and those which do not require public hearing as per EIA notification

Infrastructure sector

Sub-sectors	Corresponding project/ activity and no. as per the Schedule given in EIA notification and project/ activity which needs Public hearing as per EIA notification	Recommended Public Consultation mechanism and activities in the context of Himachal Pradesh and Environment Master Plan for sectors not requiring Public hearing as per EIA notification, 2006
1 Roads, highways, rural roads and Transport	7(a) Airports 7(f) Highways 7(g) Aerial Ropeways	Public hearing is exempted in cases where expansion of Roads and Highways is proposed (item 7 (f) of the Schedule) and which do not involve any further acquisition of land. However, HP- PWD and other concerned departments may consult with PRIs on issues relating to access to village commons (pastureland, water resources etc.), water, air and noise pollution, dumping of muck and other locale specific issues.
2 Hydropower (generation transmission, and distribution)	1(c) River Valley Projects	
3 Tourism, Ecotourism + Art, Architecture and cultural heritage		Public hearing is not mandatory as per EIA notification even if it entails Building/ Construction projects as part of developing the health Infrastructure. However, Tourism Department may consult with other concerned PRIs, ZPs and other stakeholders on the issues relating to site selection of the locations for proposed tourism infrastructural facilities, solid and liquid/waste

Sub-sectors	Corresponding project/ activity and no. as per the Schedule given in EIA notification and project/ activity which needs Public hearing as per EIA notification	Recommended Public Consultation mechanism and activities in the context of Himachal Pradesh and Environment Master Plan for sectors not requiring Public hearing as per EIA notification, 2006
		disposal facilities and other locale specific and socio- cultural specific issues with public.
4 Industry	1(d) Thermal Power Plants 1(e) Nuclear power projects and processing of nuclear fuel 3(a) Metallurgical Industries (ferrous and non ferrous) 3(b) Cement Plants 4(a) Petroleum refining industry 4(b) Coke Oven Plants 4(c) Asbestos milling and asbestos based products 4(d) Chlor-alkali industry 4(e) Soda Ash Industry 4(f) Leather/skin/hide processing industry 5(a) Chemical Industry 5(b) Pesticides industry and pesticide specific intermediates (excluding formulations) 5(c) Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/ or reforming to aromatics) 5(d) Manmade fibres manufacturing 5(e) Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes) 5(f) Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates) 5(g) Distilleries 5(h) Integrated paint industry 5(i) Pulp & paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp with out bleaching 5(j) Sugar Industry 5(k) Induction/arc furnaces/cupola furnaces 5TPH or more 6(a) Oil & gas transportation pipe line (crude and refinery/ petrochemical products), passing through national parks /sanctuaries/coral reefs /ecologically sensitive areas including LNG Terminal 6(b) Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000) 7 (c) Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs),	Exemption of public hearing in all projects or activities located within industrial estates or parks (item 7(c) of the Schedule) approved by the concerned authorities, and which are not disallowed in such approvals. However, Industry Department for each of the project(s) -which do not require mandatory public hearing as per EIA notification, 2006- may undertake public consultation with PRIs, ZPs, and other stakeholders relating to the site(s) selected, management of environmental pollution issues and other socio-cultural issues, including redressal of issues appertaining displacement and rehabilitation.

Sub-sectors	Corresponding project/ activity and no. as per the Schedule given in EIA notification and project/ activity which needs Public hearing as per EIA notification	Recommended Public Consultation mechanism and activities in the context of Himachal Pradesh and Environment Master Plan for sectors not requiring Public hearing as per EIA notification, 2006
	Special Economic Zones (SEZs), Biotech Parks, Leather Complexes. 7 (d) Common hazardous waste treatment, storage and disposal facilities (TSDFs) 7 (h) Common Effluent Treatment Plants (CETPs)	
5 Mining and Geology	1 (a) Mining of Minerals 2 (a) Coal Washeries 2 (b) Mineral beneficiation	
6 Irrigation and Public Health	Public hearing is not mandatory for modernization of irrigation projects (item 1(c) (ii) of the Schedule).	Projects involving modernization of irrigation projects (item 1(c) (ii) of the Schedule) is exempted for conducting public hearing. IPH and other concerned departments may consult with concerned PRIs, ZPs and other stakeholders on the issues relating to site selection of the locations for Sewage Treatment Plants (STPs), other proposed infrastructural facilities, treated waste disposal facility and other locale specific issues with public.
7 Health		Public hearing is not mandatory as per EIA notification even if it entails Building / Construction projects as part of developing the health Infrastructure. However, Health Department may consult with other concerned PRIs, ZPs and other stakeholders on the issues relating to site selection of the locations, proposed infrastructural facilities, biomedical waste disposal facility and other locale specific issues with public.
8 Market Infrastructure (including horticulture and agriculture)		Public hearing is not mandatory as per EIA notification even if it entails Building / Construction projects as part of developing the Market Infrastructure. However, HP Horticultural Produce Marketing and Processing Corporation Limited (HPMC), HP State Agricultural Marketing Board, (HPSAMB), HP State Cooperative Milk Producers Fed. Ltd (HP MILKFED), Himachal Pradesh State Cooperative Marketing And Consumer's Federation Ltd. (HIMFED), H.P. Aquaculture, Fishing and Marketing Society, Himachal Pradesh State Wool Federation may consult with departments of agriculture, horticulture , fisheries, animal husbandry and livestock, PRIs, ZPs and other stakeholders on the issues relating to site selection of the locations, proposed infrastructural facilities, waste disposal from market yards and other locale specific issues.
9 Rural and Urban Planning	Public hearing not required.	Though Public Hearing is not mandatory as per EIA notification, including development of 8(a) Building /Construction projects 8(b) Townships and Area Development projects, but Department of Urban Development, Town

Sub-sectors	Corresponding project/ activity and no. as per the Schedule given in EIA notification and project/ activity which needs Public hearing as per EIA notification	Recommended Public Consultation mechanism and activities in the context of Himachal Pradesh and Environment Master Plan for sectors not requiring Public hearing as per EIA notification, 2006
		and Country Planning and Rural Development may undertake consultation with stakeholders at the time of formulation of master plans and revisions of the existing master plans

Terms of Reference (ToR) for carrying out Environment Assessments (EAs)

As per EIA notification 2006, Ministry of Environment and Forests has issued ToR of sectors for 8 broad categorization of projects or activities requiring prior environmental clearance as given in Schedule for the purpose of scoping required for EIA.
Ministry of Environment and Forests, 2009 issued Terms of Reference of 8 sectors for Environmental Impact Assessment of 1. Ports and harbours, 2. Airport development/ expansion / modernization, 3. Highway projects, 4. Building construction, Township and area development, 5. Mining of minerals, 6. Mineral beneficiation, 7. Asbestos based industries and 8 Coal washeries. Sector wise detailed ToR can be accessed on: http://envfor.nic.in/sites/default/files/so2561-050913_2.pdf

Development activity-specific ToR of Twelve sectors namely Cement Plants, Chemical Fertilizers, Chemical Effluent Treatment Plants, Common Municipal Solid Waste Management Facility, Distilleries, Industrial Estates, Offshore and onshore oil and gas exploration development and production, Pulp and Paper industry, Ship Breaking Yards, Sugar Industry and Thermal Power Plants for EIA studies have been prepared by IL&FS for MoEF. Sector wise detailed ToR can be accessed on: http://environmentclearance.nic.in / writereaddata/Form-1A/HomeLinks/12%20Model%20TORs.pdf

Besides, MoEF has issued Model ToR for River Valley and Hydel Projects, Guideline Manual for River Valley Project sector, Coal sector and general instructions for submission & consideration of ToR/EC applications of coal sector projects which can be accessed on http://environmentclearance.nic.in/writereaddata/Form-1A/HomeLinks/ommodel.html

Besides, 37 sectoral manuals under EIA Notification, 2006 has been prepared for providing guidance to the project proponent and developers seeking environment clearance. MOEF has issued 10 sectoral manuals for sectors namely Mining, Mineral Beneficiation, Ports and Harbours, Airports, Building and Townships Construction, Asbestos, Highway, Coal Washery, Aerial Ropeways, Nuclear Power Plants, Nuclear Fuel Processing plants and Nuclear Waste Management Plants. Besides, IL&FS (for MoEF) has prepared 27 EIA manuals for Thermal Power, Cement, Ship Breaking Yards, Chemical Fertilizers, Sugar, Distilleries, Leather/Skin/Hide Processing Industry, Offshore and On-shore Oil & Gas Exploration, Development & production, Common Effluent Treatment Plants (CETPs), Industrial Estates, Pulp & Paper, Common Municipal Solid Wastes, Petroleum Refineries, Petrochemical Plants, Pesticides and Pesticide Intermediates, Chlor Alkali Industry, Synthetic Organic Industry, Petrol-chemical based production, Coke Oven Plants, Soda Ash, Integrated Paints, Man-made Fibre, Oil & Gas Transportation pipe-line, Isolated Storages and handling of hazardous chemicals, Metallurgical Industries, Induction/Arc Furnaces and Common Hazardous Waste Treatment, Storage and Common Hazardous Waste Treatment, Storage and Disposal Facilities

Good practice examples to illustrate innovative solutions for identified issues while balancing economic, social and ecological considerations.

The Environment and Social guidelines includes existing and documented good practices (relating to identified issues, threats and impacts) from Himachal Pradesh, Himalayan and other regions, including relevant international good practices to address and mitigate negative impacts and strengthen the services in the sector through awareness programmes, training and capacity building.

1.0 Tourism Art & Culture

A. Background

The objective of Government of Himachal Pradesh (HP) is to prepare an Environment Master Plan (EMP) is to mainstream environmental concerns into the State's development process for the next few decades. Under of EMP twenty two sector specific guidelines have been developed which have included baseline environment data collection related to the sector; conducting spatial vulnerability assessment; developing public consultation and communication strategy; institutional mechanism; establishing training and capacity enhancement mechanisms; and developing monitoring and evaluation protocol for the implementation of EMP.

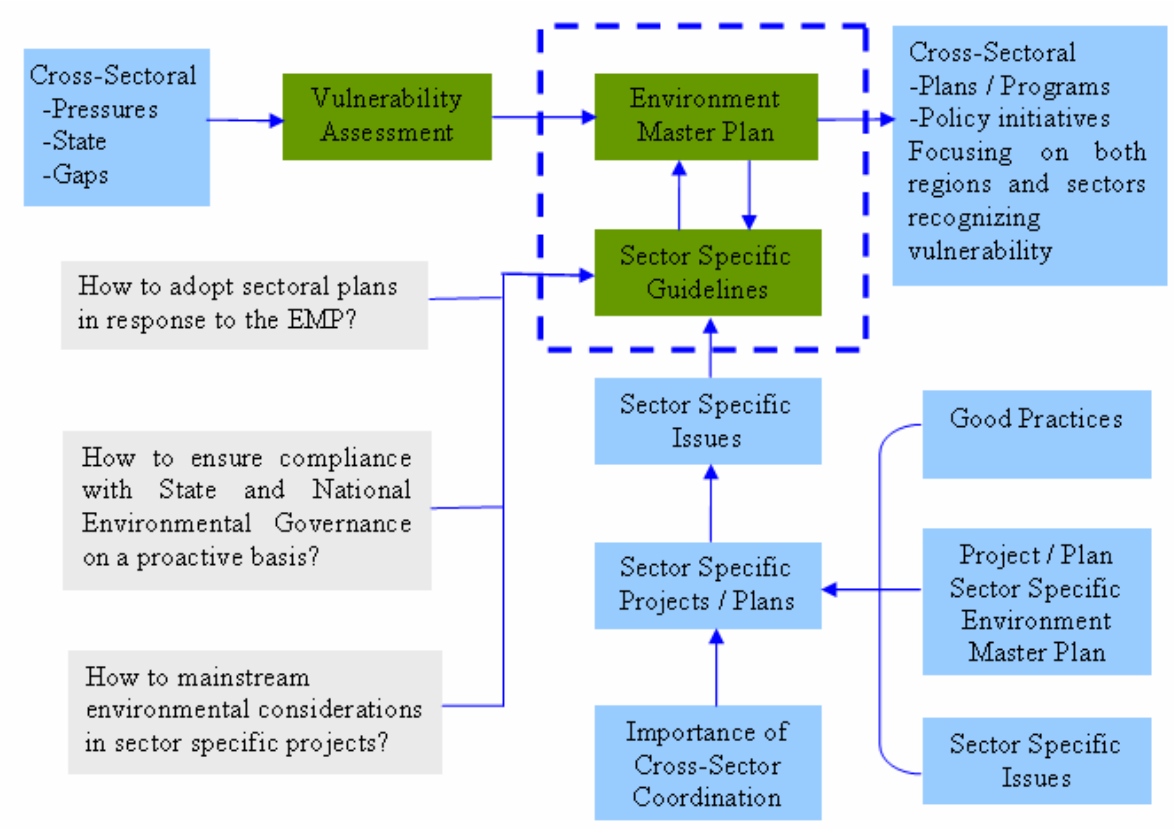

Figure 1: Sector Specific Guidelines and Vulnerability Assessment

It is expected that sector specific guidelines will be either guided by or will get influenced by State level Environment Master Plan (EMP) (see Figure 1). Vulnerability assessment of different environmental components will guide the preparation of State level EMP. Efforts to include most of the environmental and social issues that are sector specific or are of cross-sectoral nature have been done to address in the EMP. The sector specific guidelines will aid in mainstreaming such gaps and strengthening the EMP. In practice, the guidelines will also encourage inter-sectoral coordination among State Departments and other relevant agencies to ensure enhanced outcomes.

Besides, the guidelines will address sector specific environmental and social issues and their management. The guidelines will also delineate good practices and measures to mitigate negative impacts and strengthen the services in the sector through awareness programmes, training and capacity building.

B. Need for the present guidelines

Tourism in Himachal Pradesh is creating an immense pressure on environmental resources. These are various places of interest for tourists in Himachal Pradesh which have been identified by Government of Himachal Pradesh.

There are four tourist circuits as identified by the Department of Tourism and Civil Aviation (DoT) Government of Himachal Pradesh. The Sutlej circuit covers Rohru – Rampur – Sarahan – Narkanda – Naldhera – Tattapani – Sarahan – Kiarighat – Delhi - Parwanoo - Kasauli - Barog - Solan - Chail - Hatkoti - Rampur - Sarahan - Narkanda - Naldehra - Tattapani - Shimla - Kiarighat - Delhi. This circuit also includes Renuka, Paonta Sahib and Nahan. The Beas circuit covers Delhi - Swarghat - Bilaspur - Mandi - Rewalsar - Kullu - Manali - Rohtang - Naggar - manikaran - Delhi Rohtang – Nagar Malikaran – Delhi. The Dhauladhar circuit covers Chintpurni Jwalamukhi Kangra – Dalhousie Khajjiar – Chamba Dharamshala – Chamunda Palampur – Jogindernagar – Delhi. The Tribal Circuit covers Delhi – Shimla – Narkanda / Hatkoi – Sarahan – Sangla – Kalpa – Nako – Tabo – Dhankar - Pin Valley – Kaza – Losar – Kunzum – Koksar – Sissu-Tanat – Udaipur – Trilokpur – Rohtang – Manali - Delhi. The Ministry of Tourism has identified three important Buddhist circuits, which include Dharamshala – Tabo Monastry – Tabo – Dharamshala; Kinnaur - Sangla Valley – Tabo Monastry – Kinnaur; and Dharamshala – Pangi – Leh – Dharamshala.

Himachal Pradesh has several ancient Hindu temples and places of pilgrimage. It is home to many of the 'Shaktipeeths' revered by the Hindus. These are located at Kangra (Vajreshwari Devi), Chintapurni (Chinmastika Devi), Jwalaji (Jwalamukhi), Naina Devi and Sarahan (Bhimakali). There are other shrines that draw thousands of pilgrims, such as Chamunda Devi, Deot Sidh, Baba Balak Nath and Trilokpur. Centres of Sikh pilgrimage are situated at Manikaran, Paonta Sahib, Baba Barbhag Singh and Rewalsar. A number of churches are located at Shimla, Dagshai, Kotgarh, Kasauli, Palampur, Dharamsala, Dalhousie and Chamba. There are several Buddhist sites in Himachal Pradesh. McLeodganj, the seat of the Dalai Lama attracts several visitors from overseas. The Tabo monastery situated in Spiti dates back to 996 AD.

Trend analysis of domestic tourist traffic in Himachal Pradesh indicates that it increased from 16,01,500 in 1996 to 51,11,692 in 2001, thereby registering a 200 percent growth within a period of five years. Similarly, foreign tourist arrival increased from 51,360 to 1,33,028, which means a 159 percent growth within the same period. The total tourist arrival in the State was 84 percent of its total population in 2001, indicating significant pressure on its existing infrastructure and services.

As per Ministry of Tourism, Government of India estimates, the total tourist traffic in the state is expected to increase from 1,11,54,440 in 2011 to 1,71,63,798 in 2021, , based on

dynamic forecasting. The total tourist arrival in the state is expected to exceed the total projected population by 52% in 2011 to 94% in 2021. This indicates huge pressure on natural and manmade resources in the state.

The demand and supply gap in terms of bed required and bed available in the state is expected to reach 63,883 in 2011 and 1,34,765 in 2021. This translates into an additional 80 and 168 hectares of built up area and 136 and 258 hectares of total area requirements by 2011 and 2021 in the state.

The additional water supply demand due to tourist arrivals is expected to increase from 1394 mld in 2011 to 2145 mld in 2021. The seasonality of tourist traffic will exert significant pressure on water availability during the lean season.

The additional sewage generation due to tourist arrivals is expected to reach 1115.2 mld in 2011 and 1716 mld in 2021. This will create significant pressure on the existing sewage collection, treatment and disposal infrastructure. In the absence of additional capacity augmentation, the untreated sewage will create significant potential of water and land pollution and can pose major public health hazard.

The additional municipal solid waste (MSW) generation due to tourist arrivals will reach 4461 tons / day and 6865 tons / day in 2011 and 2021, respectively. This will create significant pressure on the existing MSW collection, treatment and disposal infrastructure. In the absence of additional capacity augmentation, the littered and unattended MSW will create poor sanitary and hygiene conditions and can pose major public health hazard.

The additional transportation requirement due to tourist arrivals is expected to increase to 14411PCUs and 19289 Passenger Car Unit per day in 2011 and 2021, respectively during peak season. Considering Bharat Stage-II norms, the expected additional average daily CO load is expected to be 153 kg/day in 2011 and 188 kg/day in 2021. The expected additional average daily HC load on account of additional PCUs will grow to 36 kg/day in 2011 and 44 kg/day in 2021.

The additional electricity demand on account of additional cover area requirement/occupancy in hotels is expected to reach 3,06,31 MWH in 2011 and 3,76,548 MWH in 2021 during the winter season. The expected additional electricity demand on account of tourist occupancy in hotels will grow to 14,52,588 MWH in 2011 and 19,44,315 MWH in 2021 during summer/peak season. This demand will exert pressure on existing hydropower generation in the state.

The diversion of tourist traffic to villages, forests and other proposed ecotourism centres offers significant pressure on environmental resources in vulnerable areas.

A significant increase in footfalls at culture and heritage sites is expected to increase their vulnerability to air pollution due to transportation and solid waste generation in their vicinity. It is expected to increase their vulnerability to low aesthetics/view as well as safety.

As per Ministry of Tourism, Government of India's 2001-2002 estimates for domestic tourists, the average expenditure per day for a person is Rs. 500, while an average traveling budget for a family ranges from Rs. 15,000 to Rs. 17,000. The amount spent per day by a foreign tourist has been estimated at Rs. 460, which is less than that of the domestic tourist and an indicator of low-end foreign tourist, who spends below US$ 10 per day.

The guidelines provide directions to target audience for addressing and managing identified environmental issues associated with the sector. The guidelines delineate various good practices and measures to overcome the present issues in the State.

C. Objectives

Following are the main objectives of the proposed guidelines:

- Develop awareness about the issues related to tourism, art and culture in view of the fact that environmental issues associated with tourist destinations and tourist circuits act as sources of water pollution, poor sanitation, littering, air pollution, solid waste generation and disposal, cleanliness and hygiene.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance the development of the sector and associated services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

D. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (Urban Local Bodies, *Panchayati Raj* Institutions) including Department of Tourism & Civil Aviation, Department of Language, Art & Culture, Forests, Irrigation and Public Health (IPH), Municipalities, Public Works Department, Transportation and other tourism related Department and Private Sector for future planning.
- Non Government Organizations, Civil Society Organizations and other training institutes for awareness generation and project participation.
- The people of Himachal Pradesh, so that they are encouraged to adopt environmentally sustainable management practices to promote tourism in the State.

1.1 Potable Water Supply

A. Need for the present guidelines

Drinking water supply poses a major problem in the State of Himachal Pradesh. Because of high altitude terrain and undulating topography, drinking water is mainly obtained from streams and sometimes from ground water. Since villages are sparsely populated and distantly located, the pressure on drinking water supply schemes increases.

In 1948, except four towns, no other habitation in the State had piped water supply. By 1989, drinking water through pipes was made available in about 15,000 villages covering about 75 percent of the State population. By March 2006, more than 40107 habitations have been provided with drinking water facilities under various State plans and water supply schemes under Bharat Nirman Yojna.

Although, majority of the State has access to drinking water facility, there are many issues in the 'availability' of potable drinking water. These issues are: high power costs for piped supply; unauthorised tapping of water; lack of sanitation and open defecation - contaminating the sources; and resource constraints w.r.t. for operation & maintenance.

The State norms adopted for providing drinking water to rural population is 90 litres per capita per day (lpcd) which is divided as follows: 40 lpcd of safe drinking for human beings and an additional 30 lpcd for cattle in the Desert Development programme Areas. Thus, the potable water supplied is not only used for drinking, but is also used for other purposes like flushing, bathing, washing etc. Further, farmers use potable water for irrigation purposes. Also, in industries, potable drinking water is used for various industrial processes and cleaning purposes. All the above factors contribute in increasing its demand and lead to scarcity of resources.

Diarrhoeal diseases, respiratory infections and other infectious diseases rank among the top ten causes of disease burden among males and females including infants in the State. This is on account of inadequate sanitation, consumption of unhygienic food,

microbiological and chemical contamination and unhygienic living conditions both in some areas of rural and urban areas in the State.
Poor sanitation at some places in the state results on account of generation of sewage, municipal solid waste and biomedical waste without adequate collection, transportation and disposal infrastructure, which is still in the process of development in the State.

The guidelines provide directions for judicious management and conservation of potable water to reduce its scarcity and lower the demand. The guidelines delineate various good practices and measures to overcome the present water supply issues in the State of Himachal Pradesh.

B. Objectives

Following are the main objectives of the proposed guidelines:

- Develop awareness about the issues related to potable water supply and sewage/waste water/sanitation services.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance water supply and sewage disposal and sanitation services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (*Panchayati Raj* Institutions) including Department of Irrigation and Public Health (IPH), Health and Family Welfare, Municipalities, Department of Urban Development, Urban Local Bodies, Health Societies and Private Sector and other water related Departments for coordinated future planning.
- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness generation.
- People of Himachal Pradesh, so that they are encouraged to adopt and practice water conservation.

1.2 Sewage

A. Need for the present guidelines

Sewage generation and disposal poses a major problem in the State of Himachal Pradesh. Because of high altitude terrain and undulating topography, sewage finds its way into surface and ground water, thereby polluting drinking water sources.

Increasing gap in the demand 7 supply of drinking water and mismanagement in the sewage collection treatment & disposal services is leading to water pollution and breaking out of water borne diseases.

Although, majority of people in the State have access to drinking water facility, there are many issues related to potable drinking water getting contaminated by sewage. Some of the issues related to sewage sector include high power costs of sewage treatment, lack of sanitation and open defecation. Poor sanitation conditions prevailing at some areas in the State is due to mismanagement in the sewage generation and its collection, transportation and disposal.

Open defecation in urban areas and at tourists/traffic transit points, like *dhabas* in rural areas serve as sources of water pollution and public health risk.

Diarrhoeal and other infectious diseases rank among the top ten causes of diseases burden in males and females including infants in the State. This is on account of inadequate sanitation, consumption of unhygienic food, microbiological and chemical contamination and unhygienic living conditions both in some areas of rural and urban in the State.

Delay in reforms and lack of integrated water resources management leads to poor Private Sector participation and gaps in management required to prevent and to upgrade existing infrastructure and develop new infrastructure. Lack of integrated water resources, water supply and sewage/sanitation planning is leading to gaps in both up-stream and down-stream water sector project planning and implementation. Further, the involvement of multiple institutions leads to inadequate coordination at planning, implementation and Operation & Maintenance levels.

Lack of implementation awareness about water supply and sanitation both in rural and urban areas contribute to pollution load.

The guidelines provide directions for judicious management of sewage system and conservation of water to reduce its scarcity and lower the gap between demand and supply. The guidelines delineate various good practices and measures to overcome the present sewage issues in the State of Himachal Pradesh.

B. Objectives

Following are the main objectives of the proposed guidelines:

- Develop awareness about the issues related to sewage/waste water/sanitation services.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance sewage treatment, sewage disposal and sanitation services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (*Panchayati Raj* Institutions) including Department of Irrigation and Public Health (IPH), Health and Family Welfare, Municipalities, Department of Urban Development, Urban Local Bodies, Health Societies and Private Sector and other water related Departments for coordinated future planning.
- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness development.
- People of Himachal Pradesh, so that they are encouraged to adopt and practice safe sanitation.

1.3 Health

A. Need for the present guidelines

Himachal Pradesh provides health services to the population through Public and Private Sector and voluntary health care system. These services are provided through allopathic and Indian System of Medicines.

Allopathic health care services are provided through 52 Civil Hospitals, 73 Community Health Centres, 449 Primary Health Centres, 23 Civil Dispensaries and 2071 Sub Centres. There are six teaching hospitals, six leprosy hospitals, two TB hospitals, two medical colleges and three dental colleges in the State. The total bed capacity in the sector is 8747.

Health care services using Indian System of Medicines (ISM) are provided through 23 Ayurvedic hospitals, 1112 Ayurvedic dispensaries, 14 Homeopathy dispensaries, three Unani dispensaries, four Amchi Clinics andoneNatureCareUnitatOpelinUna District. There is one Ayurvedic college at Paprola (Kangra) and two Panchkarma units at Bilaspur and Paprola. The total bed capacity in the ISM sector is 410.

As per 2001 census, the State has 16 nursing homes and 838 registered medical practitioners. The total bed capacity in the Private Sector in the State is 500. There were

various private and charitable hospitals in Himachal Pradesh one of the successful example is Radha Swami Charitable Hospital at Bhota, District Hamirpur. NGOs have participated to a limited extent in providing curative services in the State.

Trend analysis indicates that the State has achieved significant progress in bringing down crude death rate, infant mortality rate and in raising the standard of living and expectancy of life. The National Family and Health Surveys (NFHS)-2 indicate that the median distance between Primary Health Centres (from PHCs to PHCs) has reduced from 6.9 kms to 6.1 kms during the period 1992 to 1998. The median distance between Sub Centres has reduced from 3.5 km to 1.5 km during the same period.

Diarrhoeal diseases, respiratory infections and other infectious diseases rank among the top ten causes of diseases burden among males and females including infants in the State. This is on account of inadequate sanitation, consumption of unhygienic food, microbiological and chemical contamination and unhygienic living conditions both at some place in rural and urban areas in the State.

Poor sanitation conditions prevail in the State at some place due to generation of sewage, Municipal solid waste and biomedical waste without adequate infrastructure for their collection, transportation and disposal.

Air pollution from emissions due to increase in vehicular traffic in urban centres and industries and burning wood as domestic fuel in rural households add to the disease burden in the State. As per NFHS-3 (2005-06), about 77 percent of rural households use open fire/*chullah* without chimney for cooking.

Inaccessible remote areas, inadequate infrastructure facilities due to growing numbers of patients and non-availability of medical and poor medical human resources at primary and Community Health Centres in remote areas are major issues for service delivery in the sector.

NFHS-3 (2005-06) indicates that the vaccination coverage of children in the age group 12-23 months has declined from 83 percent during NFHS-2 (1998-99) to 74 percent in the State.

State level health survey findings indicate that the population is less willing to pay for health services.

The guidelines provide directions to target audience for addressing and managing identified environmental and public health issues in order to strengthen efforts to reduce the burden of diseases. The guidelines delineate various good practices and measures to overcome the present issues in the State.

B. Objectives

Following are the main objectives of the proposed guidelines:

- Develop awareness about the issues related to health sector, particularly health risks due to environmental issues like water pollution, poor sanitation, air pollution, availability of health facilities and biomedical waste generation and disposal.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance sector development and associated services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (*Panchayati Raj* Institutions) including Department of Health and Family Welfare, Irrigation and Public Health (IPH), Department of Agriculture, Department of Forest, Urban

Local Bodies, Municipalities, health societies, and Private Sector for future planning.

- Non Government Organization, Civil Society Organizations (CSOs) and other training institutes for awareness development.
- People of Himachal Pradesh, so that they are encouraged to adopt health and sanitation, bio-medical/Municipal solid waste disposal and management practices.

1.4 Road & Transport

A. Need for the present guidelines

Himachal Pradesh has a wide network of roads connecting its cities, important towns, villages, industrial centers, places of tourist importance and other remotely situated areas. The primary road network consists of 1470.606 kms of eleven National Highways; 713 kms of Border Roads; 2164 kms of State Highways; 2241 kms of Major Districts Roads and about 20246 kms of Rural Roads. Few of these roads are in poor condition and do not conform to the standards required for safe and efficient movement of traffic.

The State has a total of 20118 census villages out of which only 8156 villages have been connected with all weather roads. It has been estimated that the State has a possibility of constructing 39045 kms of road length within the boundaries of the state to provide connectivity to all the villages. The road length upto 31216 kms have been constructed upto 31st March 2010, thereby requiring construction of another about 7829 kms of roads in the State.

As of 31st March 2005, the length of the motorable roads was only 24922 kms. About 90 percent of these motorable road lengths are single lane roads and only 10 percent, i.e., 2492 kms are double lane roads. Approximate 60 percent of these motorable roads are metalled and/or tarred, and the rest is unmetalled. On an average, about 2500 kilometers of road is added every five years. The growth rate of road network was higher during first to fifth plan periods, which slowed down in the subsequent years, as the funds were diverted to other sectors of the economy like health, education and social services.

Planning of road in hill areas is much different in comparison to plains. Significantly, large number of villages are sparsely populated and located in isolation at different altitudes, unlike in plains. Generally, it is not possible topographically as well as economically to directly link them with motorable roads. Alignment of roads has, thus, to be circuitous and is primarily governed by topography.

The main concerns in road sector in the hilly terrain of Himachal Pradesh is careful planning for widening and strengthening of the road in deep valleys and steep hills, as there are unstable and loose sedimentary geological formations; narrow settlements where the widening options are limited; bypass and/or realignment considerations are challenging due to topographical constraints; and there are many flood and landslide prone areas.

Major environmental and social issues related to road infrastructure include deforestation, adverse impacts on flora and fauna, rehabilitation and resettlement, land use changes, air quality, water quality, erosion, landslides, human health and the spread of diseases like HIV/AIDs as stipulated in the World Bank Guidelines. These impacts manifest at construction and operation of roads and associated auxiliary services, like transport and communication. The major environmental and social issues related to transportation include limitation of parking space and air pollution because of emissions due to congestion of vehicular traffic.

There are five agencies which are handling road infrastructure in Himachal Pradesh. The National Highways are looked after by the Government of India; the State Highways by the State Public Works Department (PWD); the town roads by the Municipal bodies; and the rural roads are taken care of partly by the

PWD and partly by the Rural Development Department. The transportation sector is managed by the Department of Transport in the State.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to road infrastructure and transportation including development, connectivity and maintenance.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance sector development and associated services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and local Government (Urban Local Bodies, *Panchayati Raj* Institutions) including Public Works Department, Urban Local Bodies, Rural Development Department, Department of Forest and Wildlife
- Non Government Organizations, Civil Society Organizations and other training institutions for awareness development.
- People of Himachal Pradesh, so that they are encouraged to adopt and practice sound environmental practices for road and transportation sector.

1.5 Mining & Geology

A. Need for the present guidelines

At the time of formation of the State, the mining infrastructure was very less developed and, therefore, initially, industrialisation in the State was aimed at developing and up-dating the existing traditional skills and arts in the cottage industry and other small industrial sectors through handlooms and handicrafts. Even in the 70s, the State had very little modern manufacturing industries.

In early 1980s, efforts were initiated to industrialise the State by providing various incentives, facilities and concessions to industries and by developing the basic infrastructure necessary for industry, e.g., the cement industry based on limestone mining. In recent years, the industrial sector has grown significantly and now contributes to about 15 percent of the State Domestic Product.

The State has, in recent years, emerged as one of the most favourite destinations for industry. A large number of Private Sector industrial projects have been set up recently by reputed industrialists of the country. The Government is encouraging entrepreneurs to set up resource based industries in Himachal Pradesh, e.g., limestone as well as material from river bed.

In the past, production and consumption of limestone were negligible. However, the demand and production of limestone increased and, usually, short term permits and leases were taken by mine owners from the Mining Department of the State Government. Over a period of time, the debris generated from breaking up of limestone and the formation of channels along the slopes disturbed the traditional water, land and vegetation balance, apart from causing serious hazards to the land.

Limestone and sand mining in and around Solan town is an important economic activity, fetching good income and also providing direct and indirect employment to a few hundred families. From Deothi, on the Solan-Subathu road, upto river Giri on Solan-Rajgarh road, there are several bands of limestone belonging to Krol formations, which are exposed, but are not of cement grade. Thus, while exploitation of limestone is not on the same scale as in Barmana and Darlaghat, yet commercial exploitation of limestone quarries continues. The limestone quarries are concentrated in the

Saproon valley, and most of them are located within a radius of seven kms from Solan.

Yamuna River in District Sirmaur: In Sirmaur district, the Industries Department used to auction about 11 river beds, which also included the Yamuna river bed and its adjoining tributaries like Bata, Tons and Giri and other rivers totalling 11 rivers. With effect from 13th September 2002, the Department is not in a position to auction these 11 rivers due to NOC requirement from the Forest Department. It is important to note that another half of Yamuna river bed is in Uttarakhand State, where people are able to lift minor minerals and occasionally trespass into Himachal Pradesh.

Damtal area in district Kangra: Damtal is a border town of Nurpur sub-division of Kangra district situated on its western extremity. The stone crushing activities started in the vicinity of Damtal area, approximately, four decades ago. Initially, there were approximately four stone crushing units. The number increased to 132 units all along the border by 1998.

Nalagarh Area in District Solan: Being a border area, there is always pressure on the river beds of the Nalagarh area in district Solan for the supply of minor minerals, because the area lies in the centre of the economic development zone. With the coming of many industries in the Nalagarh area, the demand of grit has increased manifold. There is a concern that river beds are being mined more than their capacity. The last auction of river bed in the Nalagarh area was conducted on 22nd September 2000. 18 minor mineral quarries were again notified for auction on 22nd May 2001, but due to public objections and to avoid over exploitation of river bed, the auction of Nalagarh area quarries was postponed and no auction was conducted after that.

The Government has formulated a River/Stream Bed Mining Policy Guidelines and as per this policy, it was decided that in the interest of systematic/scientific mining and to reduce pressure on river/stream beds, no auction shall be done in border areas, like Nalagarh sub-division and Kasauli Tehsil of district Solan, where there are chances of over exploitation of river/stream beds and that of illegal transportation of mineral outside the State. There is every likelihood of illegal extraction there because of high demand of grit in the area.

Khanyara Area in District Kangra: This area is prone to illegal mining. The history of slate mining in Ghanyara is more than 100 years old and about 200 slate pits are also situated in the Khanyara area of Kangra district under the control of the *Panchayat*. Under the Mineral (Vesting of Rights) Act, 1983, the Government acquired the mineral rights of these slate quarries. After approval by Ministry of Environment & Forest (MoEF), the local people were asked to apply for mineral concessions. About sixteen applications were received for consideration of mineral concession grant.

Mining and quarrying leads to degradation of land through soil erosion, alkali-salinisation, water logging, pollution and reduction in organic matter content. It has several proximate and underlying causes. The proximate causes include loss of forest and tree cover (leading to erosion by surface water run-off and winds); unsustainable grazing; excessive use of irrigation (in many cases without proper drainage, leading to leaching of sodium and potassium salts); improper use of agricultural chemicals (leading to accumulation of toxic chemicals in the soil); diversion of animal wastes for domestic fuel (leading to reduction in soil nitrogen and organic matter); and disposal of industrial and domestic wastes on productive land. Rivers are also subject to siltation from sediment loads due to soil loss, which is itself linked to loss of forest and tree cover due to mining activities. Therefore, there is a need to mainstream environmental safeguards in mining and quarrying sector in the State.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to Mining and Geology.
- Provide information on key policies, plans and regulations.
- Introduce good practices in Mining Sector for sustainable use and management of naturalresource based industries and encourage mining practices, which are environment friendly and socially acceptable.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been prepared include the following:

- State and Local Government (*Panchayati Raj* Institutions) including Department of Industries, Mining and Geology (under Department of Industries), Department of Forest for future planning and other water related Departments for coordinated future planning.
- Non Government Organizations Civil Society Organisations (CSOs) and other training institutes for awareness development.
- Industries and mining sector in Himachal Pradesh, so that they adopt and practice environmental safeguards in mining operations.

1.6 Industry

A. Need for the present guidelines

Mountain ecosystem plays a key role in providing forest cover, feeding perennial river systems, conserving genetic diversity and providing an immense resource base for livelihood through sustainable tourism. At the same time, they are among the most fragile ecosystems in terms of susceptibility to anthropogenic activities. There have been significant adverse impact on mountain ecosystems by way of deforestation, submergence of river valleys, pollution of freshwater sources, despoliation of landscapes, degradation of human habitat, loss of genetic diversity, plantation of species not conducive to conservation of the mountain environment, retreat of glaciers and pollution. The most significant proximate causes of these are illegal logging and commercial fuel wood collection, besides faulty construction of infrastructure, unplanned urbanisation and lack of enforcement of building bye-laws, absence or mismanagement of sanitation systems, setting up of polluting industries, large scale mining of low unit value minerals, climate change and excessive use of agricultural chemicals. The underlying causes relate to absence of conducive policies to enable local communities to derive adequate financial returns from afforestation and non-consumptive use of forest resources, pricing policies for agricultural chemicals, inadequate enforcement of pollution standards, poor institutional capacities for urban and regional planning and Municipal regulatory functions, and preparation of environmental impact assessments of infrastructure, besides absence of consensus on means of financing Municipal infrastructure. Clearly, there is need to address these shortcomings through review of the relevant sectoral and cross-sectoral policies and institutional capacity building. Further, poorly planned human settlements, improper location of industries and infrastructure; pollution from industries and settlementsand over-exploitation of living natural resources, thereby affecting their availability and quality.

The direct causes of air pollution are emissions from the use of fossil energy, some industrial processes and other consumption activities. Industrial and municipal waste is the major cause of water and soil pollution is a serious challenge in terms of magnitude and required resources.

The degradation of land through soil erosion, alkali-salinisation, water logging, pollution by

leaching of chemical from fertilizer and pesticides into the soil and reduction in organic matter content has several proximate and underlying causes. The proximate causes include loss of forest and tree cover (leading to erosion by surface water run-off and winds), unsustainable grazing, excessive use of irrigation (in many cases without proper drainage leading to leaching of sodium and potassium salts), improper use of agricultural chemicals (leading to accumulation of toxic chemicals in the soil), diversion of animal wastes for domestic fuel (leading to reduction in soil nitrogen and organic matter) and disposal of industrial and domestic wastes on productive land.

Rivers are also subject to siltation from sediment loads due to soil loss, itself linked to loss of forest and tree cover. They are also subject to significant net water withdrawals along their course due to agricultural, industrial, and municipal use as well as pollution from human and animal waste, agricultural run-off and industrial effluents.

Pollution loads are similarly linked to pricing policies leading to inefficient use of industrial water use. In particular, revenue yields for the industries are insufficient to install and maintain effluent treatment plants. Pollution regulation for industries is typically not based on formal spatial planning to facilitate clustering of industries to realise scale of economies in effluent treatment, resulting in relatively high costs of effluent treatment and consequent increased incentives for non-compliance.

The water table has been falling rapidly in many areas of the country in recent decades. This is largely due to withdrawal for agricultural, industrial and urban use in excess of annual recharge. In urban areas, apart from withdrawals for domestic and industrial use, housing and infrastructure, such as roads prevent sufficient recharge. In addition, some pollution of groundwater occurs due to leaching of stored hazardous waste and use of agricultural chemicals, in particular, pesticides.

At the time of formation of the state, there was virtually no industry in the State of Himachal Pradesh except a few industrial establishments, such as Mohan Meakins and Nahan Foundry. Initially, industrialisation in the State was aimed at developing and up-dating the existing traditional skills and arts in the cottage and small industry sectors through handlooms and handicrafts. The main object in the policy was to use the traditional skills of the local populace and raise their standards of living. Even in the 70s, the State had very little modern manufacturing industries.

In early 1980s, efforts were initiated to industrialise the State by providing various incentives, facilities and concessions to industries and by developing the basic infrastructure necessary for industries. In recent years, the industrial sector has grown significantly and now contributes to about 15 percent of the State Domestic Product.

The efforts of the State Government to accelerate the pace of industrialisation received further impetus with the notification of special package of incentives to industry for Himachal Pradesh by the Government of India on 7.1.2003. As on date, 31924 small scale industrial units and about 256 Medium and large scale industrial units with an investment of about Rs. 3664.84 *crores* and employment of about 1.76 *lakhs* people are already existing in the State.

The State has, in recent years, emerged as one of the most favourite destinations for industry. A large number of industrial projects have been set up recently by reputed Private Sector industrialists of the country. The Government is encouraging entrepreneurs to set up resource based industries in Himachal Pradesh.

The Baddi-Barotiwala-Nalagarh area of Solan district has emerged as the textile hub of northern India. Out of 5,04,000 spindles installed in the State, 4,26,000 spindles alone have been installed in this area. This area is also emerging as the largest manufacturing hub of pharmaceutical products in the World.

Efforts are being made to encourage industries, which do not have an adverse effect on the environment. For hazardous waste management and common effluent treatment plants at Baddi, land measuring 191.08 *bighas* has been identified at village Majra *Tehsil* Nalagarh and the case for transfer of land in the name of the Industries Department has been sent to the Divisional Commissioner. Moreover, it is a Government of India scheme, which will be implemented by the local Industries Association.

To ensure a non-polluting and eco-friendly environment, a few complexes are being devoted exclusively to promoting specific industries, like IT, BT and electronic units. It has been decided that to promote their growth, upstream and downstream industries would also be allowed to be set up there. The Department would welcome units based on information technology and software.

The State Pollution Control Board regulates air pollution from sources, such as stone crushers and brick-kilns. State Board grants consent to the stone crushers under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981. At present, there are 320 stone crushers in the State. There are 102 brick kilns in the State brought under the consent mechanism of the State Board. Brick kilns mainly cause air pollution and water pollution is not a significant issue with them. All these brick kilns have provided the requisite air pollution control systems as per norms prescribed under the Environment (Protection) Act, 1986. Immediate action in reference to environment protection is needed for Yamuna River in district Sirmaur, Damtal area in district Kangra, Nalagarh area in district Solan, Ghanyara area in district Kangra and river beds

Yamuna River in District Sirmaur: In Sirmaur district, the Industries Department used to auction about 11 river beds, which also include Yamuna river bed and its adjoining tributaries like Bata, Tons and Giri and other rivers totalling 11 rivers. With effect from 13-9-02, the Department is not in a position to auction these 11 rivers for want of Forest Department clearance i.e. No Objection Certificate (NOC). It is important to note that another half of Yamuna river bed is in Uttarakhand State, where people are free to lift minor minerals and occasionally also trespass in Himachal Pradesh. Yamuna river bed has a vast inter-State boundary and illegal extraction of mineral cannot be stopped altogether in such a long stretch. There is every likelihood of illegal extraction, if the riverbed within Himachal Pradesh is not included in the auction.

Damtal area in district Kangra. Damtal is a border town of Nurpur sub-division of Kangra district on the western extremity of the district. The stone crushing activities started in the vicinity of Damtal area, approximately, four decades ago. Initially, there were, approximately, four stone crushing units. The number increased (up to 1998) to 132 units all along the border.

Nalagarh Area in District Solan: Being a border area, there is always pressure on the river beds of the Nalagarh area in district Solan for the supply of minor minerals, because the area lies in the centre of the economic development zone. With the coming of many industries in the Nalagarh area again, the demand of grit has increased manifold. There is a concern that river beds are being mined more than their capacity. The last auction of river bed in the Nalagarh area was conducted on 22/9/2000. The 18 number of minor mineral quarries were again notified for auction on 22/5/2001, but due to public objections and to avoid over exploitation of river bed, the auction of quarries of Nalagarh area was postponed and no auction was conducted after that.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to Industries.
- Provide information on key policies, plans and regulations.
- Introduce good practices in the industrial Sector for sustainable use and management of natural resource based industries and encourage practices, which are environment friendly and socially acceptable.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (*Panchayati Raj* Institutions and Urban Local Bodies (ULBs)) including Department of Industries for future planning and other water related Departments for coordinated future planning.
- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness generation.
- Industry sector in Himachal Pradesh, so that industries adopt and practice environment safeguards in industrial operations.

1.7 Energy

A. Need for the present guidelines

Himachal Pradesh has a hydropower potential of 23,230 MW. Most of hydropower projects being constructed or proposed in Himachal Pradesh are Run of the River (ROR) type as opposed to conventional storage type projects. Currently, 7201 MW, i.e., 31 percent of the total hydro-potential of the State is actualised. 6504 MW potential (28% of the total) stands allotted and with a greater pace of investment, this potential can be actualised within the Eleventh Plan period. Thus, by 2012, the State can hope to actualise 13,705 MW, i.e., 59 percent of its total potential. The remaining 9524 MW (41 percent) is expected to be completed by the end of the Twelfth Plan, i.e., by the year 2017. To achieve the actualisation of the balance hydro power potential of Himachal Pradesh, a total investment of about Rs.98,000 *crores* would be required by various entities of the State and Central Governments, as well as by the Private Sector.

Himachal Pradesh is one of the few States where energy delivered to consumers is 100 percent metred and its distribution system has 97.4 percent availability. It has also achieved more than 90 percent metring of its distribution, transformers and feeders up to 33 kilovolts (KV), resulting in aggregate technical and commercial losses of a comparatively low 16.3 percent. Power demand[1] in the State is expected to increase by 11.37 percent from 2006 to 2012 and 6.69 percent from 2012 to 2017. The increasing gap between demand and supply will lead to greater harnessing of hydropower potential, leading to associated environmental and social issues of submergence, land use change, rehabilitation and resettlement.

Out of 28 percent of the total harnessed potential in the State, 45.5 percent is from Ravi basin, followed by 35.73 percent from Yamuna basin, 35.67 percent from Beas basin, 33.44 percent from Sutlej basin, and 0.20 percent from Chenab basin. Competing water uses in each basin and down-stream ecological flow are major environmental issues, which have major implications on environment and ecology of the basin.

As per Himachal Pradesh Electricity Regulatory Commission (HPERC) data, the State's electricity deficit is 700 MW. Generally, the State generates surplus electricity from April to September and it runs into deficit from October to February. The estimated deficit is due to reduction in hydropower

[1] *The Central Electricity Authority periodically publishes electric power surveys, which include power sector data and forecasts gathered from all sector agencies to be used for planning purpose.*

generation on account of lean flow and increased heating requirements during winter months. It needs to purchase power from other sources during this period. The current revenue accruals from power sales take care of power purchased from other sources. However, in future, a need may arise to exploit other sources of power in order to bridge the growing deficit.

Himachal Pradesh's transmission assets consist of 2,100 kilometres (kms) of transmission lines rated 66 KV and above and about 100 power transformers, totalling around 2,000 megavolt-amperes of capacity. These physical interconnections of transmission network enable the State to exchange power with its regions, depending on the daily power supply balance. However, with considerable hydropower capacity additions in various stages of planning, development, and construction, there will be significant need for additional transmission capacity to be able to wheel the power in the State and out of State. The construction of this network may lead to deforestation resulting in associated environmental issues.

In Himachal Pradesh, large supply sector High Tension (HT) & Extra High Tension (EHT)) account for 61% of energy sales followed by 18% domestic, 7% Government irrigation and water pumping, 4.4% commercial and remaining 10% by other sectors. Transmission and Distribution (T&D) losses account for 19.20% to 21.17% in the State. The reduction in T&D losses by five percent offers potential to conserve energy and meet demand, thereby reducing negative environmental issues associated with hydropower development. These sectors offer potential for energy conservation, thereby having indirect impact on environment.

High siltations in reservoirs, deforestation, increased agriculture/horticulture activities in the catchment area indicate deterioration in the catchment of hydropower projects. Further, continued agriculture practice by communities in the periphery of reservoirs add to the pollution load, leading to deterioration in water quality and aquatic flora and fauna.

Energy conservation measures have been adopted by promoting CFL scheme; its benefit is expected to become visible in the current as well as ensuing years. It is anticipated that a saving of 200 MW is estimated to result from the CFLs. However, disposal of CFLs will be one of the environmental issues for the State.

According to the per capita energy consumption of the state, it has estimated, about 219.26 MU of electricity is consumed followed by 5.93 million kgs of LPG, 8.14 million kilolitres of kerosene, 7203.81 tonnes of coal and 3702.51 thousand tonnes of fuel wood. Barring electricity consumptions, fossil fuel burning is potential source of air emissions. Other options like thermal and gas based power generating plants, if installed during the next two decades to bridge the deficit, will add to emission load. The State has about 750 MW of small hydropower potential, 50 MW of Solar photovoltaic potential and about 2117 million litres per day biogas potential from livestock dung.

Therefore, major environmental and social issues related to hydropower and non-conventional sources of energy development include deforestation, submergence, adverse impacts on flora and fauna, rehabilitation and resettlement, disturbance in catchment areas, water availability/quality, land use changes, floods, siltation, erosion, landslides and drying of natural springs and air emissions.

In the above context, guidelines provide directions to target audience for addressing and managing identified environmental and social issues in order to strengthen efforts to reduce environmental impacts and optimise natural resource use. The guidelines delineate various good practices and measures to overcome the present issues in the State.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about environmental and social issues related to energy, hydropower development and power (generation, transmission and distribution) and its management. They seek to:
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance sector development and associated services.
- Encourage coordinated planning within State Departments.
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (including *Panchayati Raj* Institutions).
- Himachal Pradesh State Electricity Board, State hydropower transmission and distribution utilities, Himurja, Department of Irrigation & Public Health, Urban Local Bodies, Panchayati Raj Institutions, Department of tourism and Civil Aviation, Department of Forests and other water related Departments for coordinated future planning.
- Non Government Organizations, Community Based Organizations and other training institutes for awareness generation.
- People of Himachal Pradesh so that they are encouraged to adopt and practice energy conservation and management.

1.8 Market Infrastructure

A. Need for the present guidelines

Himachal Pradesh has the advantage of climate and topography for the cultivation of a variety of fruits. At present more than thirty types of fruit species are being grown in the State, maybe on a large or small scale, but they are available within the State. Most important are – apple, apricot, peach, pear, plum, almond, walnut, pecan nut, mandarin, sweet orange, Kagzi lime, hill lemon, mango, guava, papaya, litchi, kiwi fruit, olive and strawberry. Fruit production, which was 1200 metric tons in 1950-51, increased to 4.3 *lakh* metric tons in 2000-2001 (about 360-fold increase). Sub- tropical fruits, such as mango, litchi, guava, citrus etc. mature about one month later than in the plains, thus, fetching better prices. Temperate fruits cover about 64 percent of the total cultivated area of the state of which more than 40 percent is under apple cultivation. The area under fruit cultivation has more than doubled in the last two decades. Similarly, the productivity of apples almost doubled to 4500 kg per hectare during 2000-2001.

During the year 2008-2009, under the Market Intervention Scheme (MIS), the Horticultural Produce, Marketing and Processing Corporation (HPMC) Limited, Himachal Pradesh procured about 875.00 MT of apple due to less apple production in the State and higher prices in the market, out of which about 813.00 MT of apple was processed in the HPMC plants and about 52.70 MT of apple juice concentrate have been produced. During the year, the Corporation purchased quality apples worth Rs. 21.42 *lakhs*, which was marketed through its network in the country. The HPMC did not receive any mango fruit from the growers due to good return from the open market. It procured 41.00 MT of citrus fruits from the growers till date under this scheme. The existing market infrastructure in the state is not keeping pace with increased yield/production. It is not meeting the national norm of market availability within a radius of five km with the command area of market not exceeding 80 sq. km. Further access to market due to inadequacy of roads and transportation is also one of the major constraints, which leads to spoilage and wastage of material. Farmers have to travel long distances with their produce to avail the facility of regulated markets. Generally, the means of transport are not readily and easily available in such areas. Farmers bring their produce to the roadside and keep on waiting for transport and traders. Since there is no facility for the protection of

agricultural produce, it remains open to the vagaries of weather, theft etc. The post harvest losses of fruits and vegetables are estimated to the extent of 8% to 37%.

In Himachal Pradesh, there are one principal market yard and one or more sub yards and collection centres in each market. The Himachal Pradesh State Agricultural Marketing Board exercises superintendence and control over the APMCs.

Auction platforms are needed in the market for settlement of price of the produce in a congenial atmosphere between buyers and sellers. Both covered and open auction platforms exist in only two-thirds of the regulated markets. Therefore, existing markets also have constraints of auction platform, grading facility, drainage and solid waste management facilities.

Inadequacy of adequate scientific storage facilities, i.e., cold storage and warehousing causes heavy losses to farmers in terms of wastage in quantity and quality of produce in general and of fruits and vegetables in particular. It is well known that small farmers do not have the economic strength to retain produce with them till the market prices are favourable. The results obtained from 115 markets reveal that 96% markets of the State (109) record entry of less than 50 trucks on a normal market day.

In the absence of sanitation services, Municipal solid wastes from market and commercial establishment get mixed with sewage and result in public health risks.

Inadequacy of Private Sector participation in augmenting market infrastructure is leading to spoilage/wastage of products. Further, farmers are not able to obtain right price of their product. Gaps in awareness generation and inadequacy of usage of Information & Communication Technology (ICT) solutions add to the wastage/spoilage of products that results in high pollution load.

Use of improper packaging material is one of the reasons for these losses. In general, bamboo baskets, gunny bags or wooden boxes are used for packaging, which not only affects the quality of the produce adversely, but also puts pressure on the forest. This is leading to product spoilage or wastage.

In the above context, guidelines provide directions to target audience for addressing and managing identified environmental and social issues in order to strengthen efforts to reduce environmental impacts and optimise natural resource use. The guidelines delineate various good practices and measures to overcome the present issues in the State.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to market infrastructure considering access to market, address issues related to availability of market infrastructure, water and land pollution, inadequacy of chilling infrastructure, inadequacy of storage facilities, access to road and transportation facilities and change in land use pattern, health risks, managing of plastics and agriculture and solid waste generation and disposal.
- Provide information on key policies, plans and regulations.
- Introduce good practices to enhance sector development and associated services.
- Encourage coordinated planning within State Departments
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- State and Local Government (*Panchayati Raj* Institutions & Urban Local Bodies) including State Agriculture Marketing

Board (SAMB), Department of Agriculture, Department of Horticulture, Ministry of Agriculture and Private Sector for future planning.

- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness development.
- Stakeholders to adopt and practice good practices in the post harvest management of agri-horticulture produce, medicinal plant harvesting and other non timber forest products (NTFP) to reduce waste generation and recycle biodegradable waste.

1.9 Rural Planning

A. Need for the present guidelines

The most important aim of planning is to identify a process of development, which will raise living standards and open out to the people new opportunities for a richer, environment friendly and more prosperous life. The basic objectives of planning can be grouped under four heads, namely, growth, modernisation, self reliance and social justice. In one form or another, but possibly with varying emphasis, these objectives reflect the views of all sections of the population and represent a national consensus on the aim of planning.

The rural society of Himachal Pradesh has its own identity and psyche with regard to traditions, culture and heritage. Therefore, within the overall rural development strategies, there has to be an explicit recognition of its identity. At the time of its formation in 1971, Himachal Pradesh was an economically backward rural State (93% rural population in 1971). Its rural population was deprived of basic amenities, such as health, education and drinking water. Rural infrastructure, i.e., rural roads, electricity, housing, transport, banking and market network was also very poor. Almost half of the rural households were living below the poverty line. In Himachal Pradesh, conscious efforts for the formulation of District Plans were made during the Fifth Five Year Plan, so as to address the problems of poverty, unemployment, inequality and infrastructure backwardness. The decentralised planning process was initiated in a phased manner Himachal Pradesh were taken steps in this direction to ensure adequate involvement of people and their representatives in the decision making process. However, the mainstreaming of environment and social issues in the rural planning process has not been adequately addressed in the development programmes/projects/schemes, which intend to create employment, develop physical and social infrastructure and other community assets on a sustainable basis. Further, for planning and implementation of development programmes / projects / schemes, the capacity of local institutions, like *Panchayati Raj* Institutions (PRIs), Community Based Organisations (CBOs), such as Self Help Groups (SHGs) / Mahila Mandals is not adequate enough to achieve the poverty reduction goals and objectives of programmes / projects / schemes for sustainable and inclusive development of all sections (including disadvantaged and vulnerable sections) of the rural society and thus, achieving social cohesiveness.

The population of the State as per 2011 Census is 68,56,509 of which 34,73,892 are male and 33,82,617 are females. There are 974 females per 1000 males recorded in 2011 as agai nst 968 per 1000 males in 2001. The percentage decadal growth during 2001-2011 is 12.81 as against 17.54 during 1991-2001. The density of population rose from 109 per sq km in 2001 to 123 per sq km in 2011. Himachal Pradesh has the highest percentage of rural population among all the States of the country.

The mainstay of the people of Himachal Pradesh is agriculture on which 66.71 percent population depends for their livelihood. The topography being mostly hilly, the type of cultivation practised is terraced farming. Close to 80% of all holdings fall in the category of small and marginal farmers. Due to ideal climate for fruit cultivation, horticulture and

vegetable growing (seasonal as well as off-season), a well-diversified farm economy has developed rapidly during the past three decades.

The percentage of main workers to total population is 32.31 and the percentage of cultivators to main workers is 55.45. The percentage of agricultural labourers to total workers is 1.22 as per 2001 Census. During 1991-2001, work force increased from 22.14 *lakhs* in 1991 to 29.93 *lakhs* in 2001, thereby recording a growth of 35.18% as against 17.54% during the previous decade. In the year 1991, the work force constituted 42.82% of the total population while in 2001, it accounted for 49.24%. Thus, during the 1991-2001 decade, the workforce increased by 6.42%. The percentage of main workers to total population decreased from 34.41% to 32.31% during 1991-2001 decade, while the percentage of marginal workers more than doubled from 8.41% to 16.92% during the same period and non-workers decreased from 57.16% to 50.76%.

The other feature of the work force reveals that 'other workers' recorded a growth of 41.05 percent over the period of a decade. Noticeable feature of the main workforce is the decrease in the category of cultivators and agricultural labourers. Cultivators decreased by 3.2% and agricultural labourers by 38.98% in the decade 1991-2001. The decline trend shows that the main workforce preferred jobs in Private Sector. It also reveals the shifting of the workforce from the traditional occupation of agriculture to commercial and industrial activities.

The population of the State registered a decadal growth of 17.53% as against 21.34% at the All India level during the decade 1991-2001, thus recording a decline of 3.26%as compared to the preceding decade 1981-91. This has been possible through a three-pronged strategy of intensive health cover, improvement in literacy rates, especially among the women and making family planning a people's movement along with a positive thrust of incentives.

The Scheduled Caste population in the State is 15,02,170 persons (2001 Census), which is 24.72% of the total population as per 2001 Census. The Scheduled Tribe population of the Pradesh, which is concentrated in districts of Kinnaur and Lahaul Spiti and parts of Chamba district (Pangi & Bharmour) and scattered in other districts, is 2,44,587, which is 4.02% of the total population. About 60% of the State's tribal population falls under the tribal sub-plan areas.

The contribution of Himachal Pradesh to India's Net Domestic Product (NDP) in 2000-01 (at current prices) was estimated at 0.62% only. According to the 2001 Census, while nearly three-fourth of India's population lived in villages, in Himachal Pradesh, more than four-fifth of the people lives in rural areas. Almost one-fourth of the State's NDP comes from agriculture and allied sectors. It shows the weak position of the primary sector of the economy, since the majority of the population lives in the rural areas and depends on agriculture. However, agriculture is of a subsistence nature and is unable to shape the level of living of the rural people. The productivity of farm based activities and off farm activities is on the decline in view of the growth of population resulting in small land holding size. In this situation, the non-farm rural sector, with its forward and backward linkages, can become an integral part of rural development in the State. But it has not received much attention. As a result, a sizeable number of people of rural areas, especially the youth, are migrating to urban centres, inside and outside the State, in search of livelihood. To stop the migration of the rural unemployed, it is essential to create better socially acceptable employment opportunities by developing non-farm activities in the rural areas. To stop this trend, basic facilities are required to be utilised properly, wherever these exist, and to be developed where these are non-existent. There is need for mobilising and involving the community in the proper maintenance of the

available facilities at the local level under *Panchayati Raj* Institutions.

Keeping in view the development that has taken place in the past plan periods, much more remains to be done to improve the quality of life in the rural areas. Himachal Pradesh, with 90.2% of its population in the rural areas, according to the 2001 census, has a sizable deprived population consisting of marginal farmers, landless labourers besides Scheduled Castes, Scheduled Tribes and Other Backward Castes. This component of the population has to be brought into focus for upliftment with special emphasis on their skill upgradation, removal of unemployment and vertical growth to acquire productive assets for better living on a sustainable basis.

For an integrated development of such a rural economy, the development of physical as well as social infrastructure has an important role, as it directly contributes to employment generation and asset creation. A better network of physical infrastructure facilities (well-built roads, rail links, irrigation, power and telecommunications, information technology, market- network, processing of horticulture and vegetables produce, cold chain system and social infrastructure support, viz health and education, water and sanitation, veterinary services and co-operatives) is essential for the development of the rural economy. There are inter-district disparities with regard to some of the basic development indicators in Himachal Pradesh. Moreover, infrastructure development in the rural areas is not adequate enough to keep pace with the demands, thereby resulting in gaps, which further create pressures on existing infrastructure and natural resources.

Himachal Pradesh has comparatively better rural infrastructure facilities, such as hundred percent rural electrification, public distribution system and households using separate kitchens. However, there are inter-district disparities in the accessibility of basic facilities and inadequate social infrastructure, namely, education and health services in rural areas.

Planning principles in rural development sector will encompass especially agriculture and allied activities since 90 percent people in rural areas and 66 percent of population is dependent on agriculture and allied sectors. The Rural development planning, therefore, should focus on agriculture and allied sectors to improve livelihood opportunities and better quality of life by providing better education and health services. In view of inadequate skills among the rural populace, skill development for diversification of livelihood opportunities in rural areas will be needed, which will, in turn, require flow of credit and institutional finance (microfinance) through banking institutions and cooperatives.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to rural planning and infrastructure development;
- Provide information on key Policies, Plans and Regulations;
- Introduce good practices for Sustainable Rural Development;
- Encourage coordinated planning within State Departments; and
- Address vulnerability related aspects.

C. Target Groups

The key players for whom the guidelines have been framed include the following:

- Department of Rural Development, Department of Planning, Local Self Governance institutions including *Panchayati Raj* Institutions, Department of Irrigation and Public Health (IPH), Health and Family Welfare and Private Sector for future planning and other Departments related to rural development for coordinated future planning.
- Non Government Organizations, Civil Society Organisations (CSOs) and other

training institutes for awareness development.

- People of Himachal Pradesh for adoption of and building stakes in Sustainable Rural Development programme related measures and practices and cooperation in their implementation.

1.10 Urban Planning

A. Need for the present guidelines

The most important aim of planning is to identify a process of development, which will raise living standards and open out to the people new opportunities for a richer, environment friendly and more prosperous life. The basic objectives of planning can be grouped under four heads namely growth, modernisation, self reliance and social justice. In one form or another, but possibly with varying emphasis, these objectives reflect the views of all sections of the population and represent a national consensus on the aim of planning.

The formation of Himachal Pradesh as a part 'C' State on April 15, 1948, with the merger of 30 erstwhile princely States marked the onset of urbanisation in the State. Himachal Pradesh experienced a sudden growth of its urban population from 0.86 *lakh* in 1941 to 1.54 *lakh* in 1951. The rate of urbanisation grew from 3.80 percent to 6.45 percent in the respective census decades. The compound annual growth rate (CAGR) of urban population rose from 1.5 percent during 1931-41 to 5.99 percent during 1941- 51. Since then, the growth of urban population has been steady. The gradual urbanisation of a predominantly rural society has been set into motion and the urban population of Himachal Pradesh has more than doubled between 1971 and 2001.

Though the growth of urbanisation has slowed down in the 1990s, yet the net increase of the State's urban population during the period 1991-2001 has been only slightly less than the total urban population of the State in 1951. The projected higher growth of the economy industry, trade, commerce and tourism in Himachal Pradesh may lead to faster urbanisation. The provisional 2011 Census data for Himachal Pradesh stands at 68,56,509. The decadal growth rate of 12.81 percent in Himachal Pradesh during 2001 -2011 is less than India's overall decadal growth rate of 17.64 percent during the same period.

From 1971 onwards, urbanization has been constant, with the Compound Annual Growth Rate (CAGR) of urban population varying between 2.86% to 3.25%. During the period 1971 to 2001, the average CAGR of the urban population, i.e. 9.41% has been considerably higher than the CAGR of the rural population i.e. 5.47%. This difference is likely to increase in the future due to the higher growth population in the urban areas, which offer better employment opportunities. The consequent economic, environmental and physical changes are likely to exert pressure on the Urban Local Bodies (ULBs) to meet the growing demand for infrastructure, such as land, water supply, sewerage, solid waste management, housing, roads etc.

District-wise trend of urbanisation indicates that Shimla, Solan and Sirmaur districts have 24.77%, 17.70% and 10.80% urban population, respectively and are the top three urbanised districts with higher level of urbanisation as compared to the State average. The urban population of Himachal Pradesh is not growing in an equitable manner. The inequalities have increased considerably in the last five decades. The two most urbanised districts of the State have 18 towns of different sizes, i.e. 10 in Shimla and eight in Solan, and these indicate a linear/corridor pattern of urbanisation. There is a ribbon type of growth of towns in other districts also, i.e., Bilaspur, Mandi, Kullu, Una, Hamirpur, Kangra and Chamba except Kinnaur and Lahaul and Spiti, which have no urban population.

Shimla, the only Class I town is highly urbanised. There are 6 Class III towns, 7 Class IV towns, 17 Class V towns and 26 Class VI towns. Two new towns, i.e., Baddi (Solan

district) and the only Census town of Mant Khas (Kangra district) came up in 2001. Pandoh, a Census town in Mandi district in 1991, lost its status in 2001. The number of towns has increased from 36 in 1971 to 57 in 2001 and the urban population of Himachal Pradesh is converging in the larger towns. It is also interesting to note that the smaller towns with a small urban population have started exhibiting a decadal rate of growth, which is as high as that of the larger towns or even higher. Manali *Nagar Panchayat* , a Class V town in Kullu district, experienced the highest decadal growth rate of +157.50 percent during 1991-2001, which is largely due to the growth of tourism in Manali, which is emerging as an alternative to Jammu and Kashmir. With the growth of urban population, the number of Municipal Councils is likely to increase. The spatial pattern of urbanisation emerging from the growth of tourism, trade and industrial activities needs to be observed and monitored for sustainable development of the urban areas.

The population base and growth trend of Municipal Towns/Cantonment Boards (CBs) confirm the unequal trend in towns of various size and class. Shimla is the largest and the only Municipal Corporation town of the State. Among the 20 Municipal Councils, Solan (0.34 *lakh*) town in Solan district is the largest and Naina Devi (0.01 *lakh*) in Bilaspur district is the smallest. Among the 28 *Nagar Panchayats*, the recently constituted *Nagar Panchayat* of Baddi (0.23 *lakh*) is the largest and Narkanda (0.007 *lakh*) is the smallest. Among the seven Cantonment Boards, Yol (0.11 *lakh*) in Kangra district is the largest and Bakloh in the Chamba district (0.02 *lakh*) is the smallest. Some Municipalities in the upper areas (inner Himalayas) of Kangra, Chamba and Kullu districts are very small in size; weak in fiscal base; and are unable to initiate projects for infrastructure development. There is a wide variation of size, population base and growth of population between towns of the same class and between towns of different classes.

Though the urban centres of Himachal Pradesh are not growing at par with those of Punjab, Haryana, and Jammu and Kashmir, yet the consequences of urbanisation pattern in the State seem to be more complicated and can have long-term implications on the ecology of Himachal Pradesh as well as that of its neighbouring States. Comparatively, the slower growth of industry, trade and commerce and the difficult mountainous terrain have controlled the expansion of urban areas and their economies. Disparities in the growth of urbanisation, the economy of the cities and the level and quality of urban infrastructure are growing within the State as well as between the States of the north-west region. Lesser investment in various sectors in a large number of towns due to their limited resource base is affecting the development of urban infrastructure/services in Himachal Pradesh.

The spatial pattern of urbanisation in Himachal Pradesh is creating imbalances of resources and deficiencies in the coverage of urban infrastructure and Municipal services. Despite the growing contribution of the urban sector, particularly the urban service sector, to the State Domestic Product (SDP), the quality and quantity of urban infrastructure continue to be poor in Himachal Pradesh. With decreasing share of the primary sector and the increasing share of the secondary and tertiary sectors in the State Domestic Product, in terms of generation of employment and total output, the share of the urban areas in State Domestic Product has increased disproportionately.

One of the major concerns in Himachal Pradesh is the growing environmental pollution due to the disposal of untreated sewage in most of the rivers by a large number of towns. Even solid waste, such as garbage, polythene bags and other domestic waste, is thrown in the rivers or dumped on the slopes. One of the major concerns in Manali is growing environmental pollution due to disposal of untreated sewage in the river Beas and unscientific disposal of non-biodegradable waste. Open defecation is common in the urban areas. This can lead to a serious ecological crisis not only in Himachal Pradesh, but also in the neighbouring States of

Punjab and Haryana. Himachal Pradesh has not yet created 'urbanisation strategy' or 'urban development policy' to meet the demand and shortfalls in the supply of urban infrastructure/services.
The growth of new and the existing urban centres should be planned. 'Health for All' goal of the State Government can be achieved only by providing safe drinking water, and improving the urban environmental infrastructure by scientific management of liquid and solid waste to control air, water and soil pollution. Upgradation of the urban environmental infrastructure will improve the ecology of not only the State, but also of the neighbouring States.

There is need for addressing issues relating to the negative impact of urbanisation and evolving an 'urbanisation strategy' and 'urban development policy' comprising area/region specific economic frameworks, rural-urban continuum / connectiveness / interdependence, backward and forward linkages and inter-sectoral as well as spatial and environmental dimensions of infrastructure development. Emphasis should be put on localisation, so that the urban areas are able to meet the needs of the residents without affecting the interests of the future generations. The strategy/policy should comprise long-term city/environment friendly goals, such as empowerment of the Urban Local Bodies by transferring funds, functions and functionaries and adequate urban infrastructure/services like water supply, sewerage, solid waste management, roads, street lights, housing and transport facilities.

Environmental conservation should be a major thrust area for the urban policymakers and stakeholders in infrastructure development. Creation of an enabling legal, financial and regulatory framework for infrastructure development should be the immediate policy initiative of the State Government. Urban development policy must emphasise on capacity building of the elected and appointed functionaries of local self-Governments and other officers responsible for infrastructure development in urban areas. Training of urban managers is necessary for institutional development and functional strengthening of Local Self-Government and Housing and Urban Development/Irrigation and Public Health (IPH) Departments, which are responsible for the development of urban infrastructure. Considering that the resources of the Urban Local Bodies are poor and budgetary support from the State Government and transfers/grants from the Central Government are unlikely to increase, the strategy should suggest ways and means of resource mobilisation from capital markets/non budgetary sources for financing the urban infrastructure.

B. Urban Infrastructure Scenario in Himachal Pradesh

The urban infrastructure scenario in Himachal Pradesh is grim. Deficiencies in water supply, sewerage, solid waste management, Municipal roads, streets and streetlights are becoming acute with growing urbanisation. According to the State of Environment Report, "Most towns lack sewerage systems and Solid Waste Management is also inadequate. These twin factors expose water to severe pollution hazards." The situation becomes acute in peak tourist months in summer as well as in winter. The urban infrastructure and Municipal services have been deteriorating in the larger towns and have been grossly unsatisfactory in the small towns. A considerably high proportion of the urban population remains uncovered by Municipal services. The cost of providing urban infrastructure services is higher in the urban centres of Himachal Pradesh because of difficult mountainous terrain, inadequate supply of low-cost raw materials and labour. At the same time, pricing and cost recovery of the urban infrastructure is negligible. The technology used for providing and maintaining the urban infrastructure services is old and inappropriate to meet the growing needs.

Urban decay is visible in Himachal Pradesh in the form of water and air pollution, ecological

degradation and traffic congestion. It is largely due to unplanned and uncontrolled urbanisation and faulty urban management/development systems. The pronounced inadequacy of urban infrastructure services is affecting the quality of life in the urban areas. It could be attributed to the poor fiscal health of the Urban Local Bodies. The Urban Local Bodies of small and medium towns have more serious problems due to planning bias in favour of the larger towns. Disparities in the level and quality of infrastructure between the small and large towns are expected to increase in the future. The 'Report of the Committee on India Vision 2020' has mentioned, "Greater inequality may be expected in the level of basic services across urban centres of different sizes by the year 2020, unless concerted initiative is taken to reverse the trend."

C. Target Groups

The key stakeholders for whom the guidelines have been framed include the following:

- Department of Urban Development, Department of Planning, Urban Local Bodies including Municipalities, Department of Irrigation and Public Health (IPH), Health and Family Welfare, and Private Sector for future planning and other Departments related to urban development for coordinated future planning.

- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness generation.

- People of Himachal Pradesh so that they are encouraged to adopt and build stakes in sustainable urban development programmes, related measures and practices and cooperation in their implementation.

1.11 Municipal Solid Waste

A. Need for the present guidelines

Poor sanitation on account of generation of Municipal Solid Waste (MSW) without adequate collection, transportation and disposal infrastructure in the urban/rural areas of the State is leading to increased pollution load in the State.

Waste generation and disposal poses a major problem in the State of Himachal Pradesh. Because of high altitude terrain and undulating topography, Municipal Solid Waste finds its way into surface water, thereby polluting drinking water.

A large number of towns do not have treatment facilities and are creating environmental pollution. The tourists leave a lot of garbage including polythene bags in the urban areas, which is affecting the ecology of the State. Municipal Solid Waste from floating population, e.g., tourists and other unregulated point sources like tourist transit points / tracks / camp sites/resorts/*dhabas* add to existing pollution load in the State. Throwing of garbage in drainage channels/*nallahs* and in the streets is a common practice and the Urban Local Bodies (ULBs) have to start special campaigns to desilt the *nallahs*/channels regularly.

Increasing gap in Municipal Solid Waste generation and collection, treatment and disposal services is leading to water, air and land pollution and increased burden of diseases.

One of the factors for inadequate Solid Waste Management (SWM) in the urban areas is the gap in the physical targets and achievements in several Solid Waste Management activities i.e. construction of dustbins, toilets, purchase of vehicles and construction of Solid Waste Treatment Plants (SWTP). This gap is likely to increase with the existing fiscal, institutional and functional deficiencies in the development of urban infrastructure.

Though the Urban Local Bodies of Shimla, Kullu, Manali, Nahan and Solan have Solid

Waste Treatment Plants, the problem of inadequate Solid Waste Management (SWM) continues due to the lack of segregation of waste. The Urban Local Bodies have to segregate waste either at source or at the treatment plant sites.

Diarrhoeal and other infectious diseases rank among the top ten causes of disease burden among males and females including infants in the State. This is on account of inadequate sanitation, consumption of unhygienic food, micro-biological and chemical contamination and unhygienic living conditions both in rural and urban areas in the State.

Delay in reforms and lack of community and Private Sector participation is leading to increased gaps in financing required to upgrade infrastructure and develop new infrastructure. Lack of coordinated planning due to multiplicity of institutions involved leads to inadequate coordination at planning, implementation and operation and maintenance levels.

Sanitation charges are collected by a few Municipalities, which are grossly inadequate to maintain even operation and maintenance of Solid Waste Management. Lack of awareness about sanitation both in rural and urban areas contribute to pollution load.

The guidelines provide directions for judicious management of sewage system and conservation of water to reduce the scarcity and lower the demand. The guidelines delineate various good practices and measures to overcome the present Solid Waste Management in the State of Himachal Pradesh.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to Municipal Solid Waste;
- Provide information on key policies, plans and regulations;
- Introduce good practices to enhance collection, treatment and disposal of Municipal Solid Waste;
- Encourage coordinated planning within State Departments;
- Address vulnerability related aspects.

C. Target Groups

The key stakeholders for whom the guidelines have been framed include the following:

- Municipalities, Directorate of Urban Department, ULBs, *Panchayati Raj* Institutions, Department of Irrigation and Public Health (IPH), Health and Family Welfare, Industries, Health Societies and Private Sector for future planning and other waste related Departments for coordinated future planning.
- Non Government Organisations (NGOs), Civil Society Organisations (CSOs) and other training institutes for awareness generation.
- People of Himachal Pradesh, so that they are encouraged to practice segregation of waste, reduce waste generation and adopt non consumptive life styles.

1.12 Hazardous Waste

A. Need for the present guidelines

The State Pollution Control Board, Himachal Pradesh has identified 1862 industrial units responsible for the generation of hazardous wastes as on 31.03.2011, under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. The sludge emanating from the Effluent Treatment Plants (22325 MT/Year) and other residual wastes are secured through onsite storage, while waste oil (1073 KL/Year) and process residues (3049 T/Year) are recycled. Contaminated containers numbering 339444/Year are also recycled/reused after cleaning. The status of category-wise Hazardous Waste (HW) types, quantity

generated and mode of disposal is listed below in Table 1:

Table 1: Types/Quantity and Disposal of Hazardous Waste

S. No	Types of Hazardous Waste	Quantity/Annum	Management/Mode of Disposal
1	Sludge from Effluent Treatment Plants	22325 MT/Year	Secured onsite storage & final disposal in the TSDF site
2	Waste Oil	1073 KL/Year	Recycled
3	Contaminated Containers	339444/Year	Recycled (Reused after cleaning)
4	Others (Residual wastes)	13028 MT/Year.	Secured onsite storage & final disposal in the TSDF site
5	Process Residue	3049 MT/Year	Recycling

Source: HPSPCB Shimla, as given in State of Environment Report, HP

Inadequate Hazardous Waste collection, transportation and disposal infrastructure in the urban/rural areas of the State is leading to increased pollution load.

Hazardous Waste generation and disposal poses a major problem in the State. Because of high altitude terrain and undulating topography, hazardous waste finds its way into surface water and groundwater by way of leaching into ground leading to the pollution of water sources.

– Hazardous Waste generated by Industries are usually a by-product of industrial operations, which involve heavy metals, such as Arsenic, Cadmium, Chromium, Lead, Mercury etc processes, which utilise different categories of oil and petrochemicals products such as Poly Vinyl Chloride and plastics; waste products from photocopiers- chemicals, such as Polychlorobiphenyle and finally by-products, such as dioxins and furans, which are now recognised as extremely toxic substances, affecting all forms of life. As per the report of High Powered Committee (HPC) on Hazardous Wastes set up by the Government of India, Himachal Pradesh generates 2159 tonnes per annum (TPA) of Hazardous Waste out of a national total of 4415954 TPA (as on March 2000).

Increasing gap in Hazardous Waste generation and collection, treatment and disposal services is leading to water, air and land pollution and increased disease burden.

Lack of awareness about Hazardous Waste also contributes to pollution load.

The guidelines provide directions for judicious management of Hazardous Waste. The guidelines delineate various good practices and measures to overcome the present Hazardous Waste management issues in the State of Himachal Pradesh.

B. Objectives

Following are the main objectives of the guidelines:

- Develop awareness about the issues related to Hazardous Waste;
- Provide information on key policies, plans and regulations on Hazardous Waste;
- Introduce good practices to enhance collection, treatment and disposal of hazardous waste;
- Encourage coordinated planning within State Departments;
- Address vulnerability related aspects.

C. Target Groups

The key stakeholders for whom the guidelines have been framed include the following:

- Industries, Industry Associations, Confederation of Indian Industries, (Himachal Pradesh State office), Himachal Pradesh Pollution Control Board, Department of Irrigation and Public Health (IPH), Health and Family Welfare Department, Health Societies and Private Sector for future planning and other Hazardous Waste related Departments for

coordinated future planning, Local Government Bodies.

- Non Government Organizations, Civil Society Organisations (CSOs) and other training institutes for awareness generation on hazardous waste.
- People of Himachal Pradesh so that they are encouraged to adopt and practice safe disposal of domestic hazardous waste.

Chapter 2: Key Environmental and Social Policies/Regulations

2.0 Tourism, Art & Culture

The policies and laws applicable and/or related to the State's Tourism/Eco-tourism, Art and Culture sectors, along with a brief description of their relevance, are listed below. These policies, laws, sub-programmes and strategies provide an operating framework for the sectors to address issues, causes and impacts. Detailed explanations can be acquired from the websites of relevant Departments and line Ministries, like Ministry of Environment & Forest (www.envfor.nic.in), Ministry of Tourism (http://tourism.gov.in), Ministry of Culture, Government of India (http://indiaculture.nic.in), Archaeological Survey of India (http://asi.nic.in), Department of Tourism and Civil Aviation, Government of Himachal Pradesh (http://himachaltourism.gov.in) and Himachal Pradesh Tourism Development Corporation (http://hptdc.gov.in).

National Level Policies / Regulations

The policies aim to position tourism as a major engine for economic growth with impact on rural tourism and focus on domestic tourism as a major driver of growth. It aims to create and develop integrated tourism circuits based on India's unique civilization, heritage and culture in partnership with States, Private Sector and other agencies.

National Tourism Policy, 2002

- It advocates sustainability as a guiding star of tourism. It states that development and management strategies should be so worked out as to ensure that tourism largely acts as a smokeless industry and its ecological footprints remain as soft as possible. Neither over-exploitation of natural resources should be permitted nor should the carrying capacity of the tourist-sites be ignored.

- It lays greater emphasis on eco-tourism, whose parameters should be broader than those of nature tourism alone. It must help in eliminating poverty, ending unemployment, creating new skills, enhancing the status of woman, preserving cultural heritage, encouraging tribal and local crafts and improving overall environment and facilitating the growth of a more just and fair social order.

- The policy states that the deep-rooted relationship of tourism and our cultural assets should be fully recognized. It further states that improvements and environmental upgradation of the protected monuments and the areas around them should be considered as a linchpin of the tourism industry.

- It recommends that at the institutional level, a framework needs to be evolved which is Government led, Private Sector driven and community-welfare oriented. Government has to provide a legislative framework to regulate tourism, trade and industry, ensure safety and security of the tourists, and create basic infrastructure and health-care facilities. The Private Sector has to act as the main spring board of activities and impart dynamism and speed to the process of development as well as conservation.

- It states that effective linkages and close coordination should be established with Departments, such as Civil Aviation, Environment, Forest, Railways, Home etc.

National Policy for the Integrated Development of the Himalayas, 1992: An expert group was set up by the Planning Commission to formulate a policy for the development of the Himalayas. Based on the

recommendations of this group, six sector-specific sub-committees were set up under the Chief Secretaries of the Himalayan region States to formulate and implement schemes in the areas of environment and forests; agriculture and allied activities; industry and industrial infrastructure; social sectors including health and family welfare; transport, communications and tourism and energy including non-conventional energy; and science and technology.

National Forest Policy, 1988: The National Forest Policy (1988) aims 'to ensure environmental stability and ecological balance', and directs that the domestic requirements of poor and marginalized forest users should be the first charge on forest produce. The policy calls for the enhancement of income and employment through improved and increased production of non-wood forest products (NWFPs), and proposes that a massive people's movement with the involvement of women should be generated to achieve the objectives.

National Conservation Strategy and Policy Statement on Environment and Development, 1992: Section 3.4 of the said strategy outlines the measures taken up for the conservation of forests and wildlife. These include adoption of a new Forest Policy (1988) with the principal aim of ensuring ecological balance through conservation of biological diversity, soil and water management, increasing tree cover, meeting the requirements of the rural and tribal population, increasing productivity, efficient utilization of forest produce, substitution of wood and people's involvement for achieving these objectives. Some of the initiatives included under the Forest (Conservation) Act, 1980 are stringent provisions for preventing diversion of forest land for any other purpose; formulation of a National Wildlife Action Plan; an exercise for the preparation of a National Forestry Action Programme; establishment of National Parks and Sanctuaries covering about four percent of the country's area; eco-development plans for Sanctuaries and National Parks; identification of bio-geographical zones in the country for establishing a network of protected areas including seven Biosphere Reserves set up so far; management plans for identified wetlands, mangrove areas and coral reefs; and formulation of a National River Action Plan.

Citizen's Charter, Ministry of Culture, Government of India: Salient features of this charter are:

- To protect, conserve and propagate the tangible and untangible cultural heritage of India by supporting and sustaining cultural creativity and expressions as a unifying factor within our rich diversity.
- To preserve our cultural heritage by protecting the monuments, preserving the archival materials and safeguarding the classical, folk and tribal traditions.
- To promote the diversity of cultural expressions by providing support and creating a conducive environment.
- To disseminate the creative expression of our artists through exhibitions, performances, publications and by supporting institutions and individuals engaged in the furtherance of these activities.

Environment (Protection) Act, 1986: It was the most significant and diversified national level Act to safeguard the natural environment. Para 2 of the Act's introduction Section states that the Act provides for the protection and improvement of human environment and the prevention of hazards to human beings, other living creatures, plants and property. Item 2, Chapter 1 of the Act states that 'environment' includes water, air, land and the inter-relationship, which exists among and between water, air, land and human beings, other living creatures, plants, micro-organisms and property. Environmental Pollutant is the unfavourable alteration of our surrounding, wholly or largely as a by product of man's actions, through direct or indirect effects of change in the energy pattern, radiation levels, chemical and physical constitution and abundance of organisms. 'Environmental

Pollution' means any solid, liquid or gaseous substance present in such concentrations as may be or tend to be injurious to environment. "Environmental Pollution" means the presence in the environment of any environmental pollutant. It is an umbrella Act, which has several rules under it, to address different problems related to environment and pollution control.

The Air (Prevention and Control of Pollution) Act, 1981 Amended 1987: This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

The Water (Prevention and Control of Pollution) Act, 1974 Amended 1988: This Act provides for the prevention and control of water pollution and for maintaining or restoring of wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or trade effluent or any other liquid, gaseous and solid substance into water (whether directly or indirectly) as the case may be, or is likely to create nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or aquatic organisms.

Municipal Solid Waste (Management and Handling) Rules, 2000: Section 3 defines disposal of municipal solid wastes in terms of the specified measures to prevent contamination of ground water, surface water and ambient air quality. 'Transportation' means conveyance of municipal solid wastes from place to place hygienically through specially designed transport systems, so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every municipal authority responsible for the collection, segregation, storage, transportation, processing and disposal of municipal solid wastes.

Notification on the Protection and Improvement of Quality of Environment in the Himalayas, 2001: This notification was issued by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986, specifically for environmental protection in the Himalayan states. The activities relate to location planning in urban areas, rainwater harvesting and guidelines for the construction of hill roads.

Wildlife Protection Act, 1972: The Wildlife (Protection) Act, 1972, amended in 1983, 1986, 1991, 2003, 2006 provides for the protection of wild plants and animals and regulates hunting, trade and the ecosystem of forest biodiversity.

The Act established schedules of protected plant and animal species. Hunting or harvesting these species was largely outlawed. The Act provides for the protection of wild animals, birds and plants; and for matters connected therewith or ancillary or incidental thereto. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. It has six schedules, which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties. Species listed in Schedule IV are also protected. Enforcement authorities have the power to compound offences under this Schedule (i.e., they can impose fines on the offenders). Penalties are described in Section 51 of the Act.

Section 27, Chapter IV restricts entry into the sanctuary, while Section 28 permits entry into the sanctuary for photography and tourism. Section 30 prohibits fire in the sanctuary including setting fire, burning fire or leaving fire burning in the sanctuary. Section 33 on the control of the sanctuaries, empowers the Chief Wild Life Warden to construct roads, bridges,

buildings, fences or barrier gates and carry out necessary work for the purpose of such sanctuaries. Subsection 6, under Section 35, prohibits destruction, exploitation or removal of any wild life from a National Park or damage to the habitat of any wild animal or deprive any wild animal of its habitat within a National Park.

Indian Forests Act, 1927: It is an Act to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce. The Act encourages conservation of forest biodiversity only by way of controlling and restricting the uses to which the forests can be put, and by restricting people's access to certain categories of forest.

Section 26 prohibits burning of fire or raving any fire burning in reserved forests. It prohibits quarrying of stone, and burning lime or charcoal. Section 30 prohibits the same items for protected forests. Section 35 empowers the State Government to regulate or prohibit activities in any forest or waste land for the preservation of the ridges and slopes; the prevention of land slips; the formation of ravines; the protection of land against erosion; for the maintenance of water supply in springs, rivers and tanks and for the preservation of the public health.

The Forest (Conservation) Act, 1980: The Forest (Conservation) Act, 1980 as amended in 1988, from time to time, checks the indiscriminate diversion of forest land for non-forest purposes. Prior clearance of projects requiring diversion of forests for non- forest purpose is needed under the Forest (Conservation) Act 1980. The State Government/Union Territories are required to submit formal proposals to the Central Government (Ministry of Environment and Forests) for seeking the diversion of forest land for non-forest purposes in the prescribed proforma along with details, such as flora, fauna, map of the area, compensatory afforestation proposed etc.

Under this Act, the Supreme Court passed an order on the constitution of State Compensatory Afforestation Fund Management and Planning Authority (CAMPA) in response to an affidavit filed by the Ministry of Environment & Forests State CAMPA shall seek to promote: (a) conservation, protection, regeneration and management of existing natural forests; (b) conservation, protection and management of wildlife and its habitat within and outside protected areas, including the consolidation of the protected areas; (c) compensatory afforestation; (d) environmental services, which include (i) provision of goods such as wood, non-timber forest products, fuel, fodder and water, and provision of services, such as grazing, tourism, wildlife protection and life support; (ii) regulating services, such as climate regulation, disease control, flood moderation, detoxification, carbon sequestration and health of soils, air and water regimes; (iii) non-material benefits obtained from ecosystems, spiritual, recreational, aesthetic, inspirational, educational and symbolic; and (iv) supporting such other services necessary for the production of ecosystem services, biodiversity, nutrient cycling and primary production; and (e) research, training and capacity building.

The Functions of the State CAMPA shall include, (i) funding, overseeing and promoting compensatory afforestation done in lieu of diversion of forest land for non-forestry use under the Forest (Conservation) Act, 1980; (ii) overseeing forest and wildlife conservation and protection works within forest areas undertaken and financed under the programme; (iii) maintaining a separate account in respect of the funds received for conservation and protection of Protected Areas; (iv) creating transparency for the programme and mobilising citizen support; and (v) earmarking up to two percent of the funds for Monitoring and Evaluation.

EIA Notification, 2006: This notification makes it mandatory for the eight categories of projects to prepare Environment Impact Assessment and Environment Management

Plan and seek environmental clearance. Area development projects and construction projects are covered under category 8A and 8B. New tourist resorts/units coming up in the State may fall under this category and require environmental clearance.

National Environmental Appellate Authority Act, 1997: National Environmental Appellate Authority Act, 1997 provides appellate forum for cases relating to site restrictions, developmental schemes and projects, so as to balance development and environment.

The Ancient Monuments and Archaeological Sites and Remains Act of 1958 came into force with effect from 29th August, 1958. According to the Act, ancient and historical monuments, sculptures, carvings and other like objects, archaeological sites and remains are protected and preserved. Archaeological excavations are regulated and are of national importance.

The Antiquities and Art Treasures Act of 1972 came into force with effect from 9th September, 1972. According to the Act, export trade in antiquities and art treasures is regulated and smuggling and fraudulent dealings in antiquities and ancient monuments are prevented.

Public Records Act of 1993 came into force with effect from 2nd March 1995. According to the Act, the Central Government in the Department of Culture has the power to permanently preserve public records, which are of enduring value.

State Level Policies / Regulations

Tourism Policy, 2005: This Policy document aims to provide clear direction for the development of tourism in the State. It seeks to harness the fullest potential of the State for development of tourism, which in turn can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The major objectives of the policy is to (1) establish Himachal Pradesh as a leading tourist destination in the country and abroad; (2) to make tourism a prime engine for economic development and prosperity of the State and as a major means for providing employment; (3) to encourage a strong and sustainable Private Sector participation in the creation of tourism infrastructure, especially through Public Private Partnerships; (4) to promote sustainable tourism, which is not only environmentally compatible, but also leads to economic betterment of the rural people; (5) to attract quality tourist and to increase their stay in the State; (6) to safeguard the State's natural and manmade heritage; (7) to encourage Civil Societies and Non-Governmental Organisations to promote and conduct tourism related activities; (8) to position Himachal Pradesh as a one stop destination for adventure tourism.

Thrust areas for action include rural tourism, eco tourism, pilgrimage tourism, adventure tourism, promoting unexplored areas of Himachal Pradesh, health tourism, arts, crafts and souvenirs.

Priority areas will include setting up of hill stations, spas and resorts, ski slopes, airports, tourist centres, multiplexes, parking areas, entertainment centres, amusement parks, ropeway, golf course, four/five star hotels, standardised budget accommodations etc.

In order to increase the duration of visitors'/tourists' stay, special emphasis is being placed on the development of activity-based tourism and opening up new sub destinations. To promote tourism in the countryside and to lesser-known areas, appropriate infrastructure will be developed within available resources. Efforts are being made to break the seasonality factor and tourism products have been diversified to attract the tourists in other seasons too.

To mechanise and accelerate the activities of the Tourism Department by integrating and coordinating with other Departments, like PWD, Urban Development, IPH, Health, Horticulture, Forests, Power etc.

This policy states that the Government will invest in human resource development, so that managerial and technical skills are made available with the State. The Government proposes to improve connectivity and strengthen the Tourism Development Board.

The Government proposes to replicate the Manali model of collecting green fee from tourists in other major tourism destinations. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plans will be created and implemented in time bound manner.

Single window clearances for tourism projects on the pattern of the Industries Department have been made applicable. Suitable Government land available in the State either through land bank or otherwise will be transferred to the Tourism Department, which will be further leased out to private entrepreneurs strictly on the basis of open and competitive bidding.

The State Government will take steps to ensure proper hygienic conditions and to prevent the exploitation of tourists on National and State highways and at tourist places. The Government proposes to classify the *dhabas* situated on the National and State highways. The classification will be done on the basis of facilities provided, hygienic condition, quality of the food, availability of toilets, parkings etc.

The Tourist Police in the State will be strengthened by placing a cadre of 500 police and Home Guard personnel, who will be trained for regulating tourism related activities.

Revised Policy on Development of Eco-Tourism in Himachal Pradesh, 2005: The Revised Eco-Tourism Policy aims to bring the wilderness of Himachal Pradesh closer to the tourists visiting the State and, at the same time, attempts to put in place adequate safeguards and systems leading to the preservation of these natural resources.

By involving the local communities, the policy would help in improving their prosperity through increased livelihood opportunities. The policy would also ensure adequate economic returns to the State, which would be ploughed back into the environmental system for its proper upkeep and maintenance.

The vision of this policy is to preserve and protect the natural heritage, both flora and fauna, of Himachal Pradesh and attract discerning tourists and visitors to the State and in the bargain, provide opportunities to enhance the livelihood of the local people and alongside, generate revenue for the sustainable development of its resources through the creation of a Special Purpose Vehicle (SPV).

The eco-tourism policy would encourage a partnership between the SPV on the one hand and the Civil Society (local communities, NGOs, academic institutions and private enterprises/businesses) and the State (Forest, Tourism and Fisheries Departments) on the other.

This policy aims to ensure safeguards from environment point of view to effectively regulate eco-tourism activities in the forest area. The policy promotes conducting periodic impact assessment studies, whether positive or negative with regard to each project covering environmental issues, i.e., tourist number and carrying capacity economic i.e. seasonal employment opportunities for porters, employment of women etc. and socio-cultural i.e. decline in local support for local traditions and institutions, changes in traditional architecture, adverse impact on women etc.

The eco-tourism policy prescribes safety measures for tourists, environment and advocates introduction of regulatory measures

to ensure social, cultural and environmental sustainability.

The policy states that ecological and environmental concerns would form an important component of the Tourism Master Plans for popular destinations. Revenues generated would be ploughed back for the maintenance and preservation of the environment. The Department of Forest would constantly evaluate the project and if it is found that Community Based Eco-tourism (CBET)/eco-tourism norms and concepts are not being followed, the project will be terminated forthwith.

The policy aims to create a cadre of personnel within and outside the Forest Department, who are sensitive to the tenets of eco-tourism and can act as resource persons to further its cause. This policy promotes awareness generation and capacity building of the principal actors.

The SPV created to promote eco-tourism will coordinate with the Government for fund allocation which would be made available through the Externally Aided Projects, the Catchment Area Treatment (CAT) plan funds in the Forest Department and capacity building programmes of Tourism Development Board. A percentage of the CAT Plan funds would be earmarked for eco-tourism purposes. The Government would encourage people's participation in eco-tourism through *Panchayati Raj* Institutions (PRIs), local bodies, co-operatives, Non-Governmental Organisations, enterprising local youth and *Mahila Mandals* to create public awareness and to achieve a wider spread of tourist facilities.

This policy aims to actively coordinate with the Tourism, Fisheries, Handicrafts, Culture, Youth Services & Sports (YSS), Himalayan Mountaineering Institute (HMI) and other related Departments to further the cause of eco-tourism. The policy promotes coordination with partner Departments in the Government. The Government will aim to achieve necessary linkages and synergies in the policies and programmes of all concerned Departments / Agencies by establishing effective coordination mechanisms at the State and the district levels. Linkages with other policies / programmes of the State Government will be established, especially with the new revised forest policy, the new tourism policy of the State and active involvement of various other Departments i.e. Rural Development, Department of Fisheries, Town and Country Planning, Youth Services and Sports, Culture, Handicrafts and Handloom etc.

This policy aims to decongest the over-loaded tourist places, so that the benefits of tourism are spread to rural areas. It will work in tandem with the Rural Tourism Scheme of the Department of Tourism.

It will concentrate its activities within the forest land, existing Wild Life Sanctuaries and Parks. It states that the Forest Department will identify sites for eco-tourism and hand them over for management to the SPV (the ownership would continue with the Forest Department). The existing projects and sites being managed by various societies constituted till date will also function under the directions and guidelines issued by the apex body i.e. the SPV created for the purpose.

The endeavour would be to extend maximum benefit to the local community either in the form of employment or income generation. All things being equal, priority would be given to the local communities, which may come forward to take up activities - economic or promotional. The local communities would include PRIs, CBOs, User Groups, *Mahila Mandal, Yuvak Mandals*, Forest Development Committees, Watershed Development Committees etc. Even where site is leased out to private parties under Public Private Partnerships, part of the income (at least 10 percent) would accrue to the local *Panchayat*/CBO. Members of the local community will be represented in the committee/society of the project/site.

State Forest Policy, 1980: The first State Forest Policy for Himachal Pradesh was adopted on 3rd September, 1980 in furtherance of the National Forest Policy resolution of 1952. In 1988, India introduced a progressive National Forest Policy that recognised the relationship between rural poverty and environmental protection. Under the guiding principles of National Policies, the State Forest Policy promoted Participatory Forest Management across the entire State through *Sanjhi Van Yojana* [SVY] and other projects. The Forest Sector Policy supports decentralisation through the three tier system of local Government.

The Forest Sector Policy, 2005: The Forest Sector Policy seeks to achieve sustainable forest management in Himachal Pradesh i.e. forests, watersheds, wildlife, biodiversity and habitats for the maintenance and rehabilitation of its environment and strive for enhanced livelihoods for the people of the State, especially women and other resource poor groups. The major objectives include conservation and improvement in the status of natural resources in the State, especially forests, wildlife and biodiversity through effective watershed management practices, conservation and management of forests, scientifically and contemporarily by incorporating the best practices from within and outside the State, for the present and future generations, and to increase their values – historical, cultural, religious, economic and aesthetic – for communities and the environment on a sustainable basis; strive towards appropriate land use in the State, especially in the context of sustainable forest management, focusing on other primary land use sectors, such as agriculture, horticulture, animal husbandry and those related to infrastructure development.

Section 6 describes classification of forests for different purposes including community and urban forests. An enabling legal framework including review of the Participatory Forest Management Rules, 2001 will be made for the management and control of community forests. The establishment and maintenance of green belts in urban areas as part of urban land use planning will be promoted by establishing linkage with Urban Authorities and Town and Country Planning Departments of the State Government.

Some of the strategies include making a coordinated and collaborative effort from all land using sectors to achieve and enhance the target of 35.5 percent forest and tree cover through measures, such as reforestation and afforestation, agro forestry, farm forestry and utilising marginal and private lands for fodder development.

Urbanisation Policy, 2009: Section 19 of the said Policy deals with the preservation of environment. Various Subsections refer to environment on forest land, green cover, natural drainage slopes, restoration of vegetal cover, construction restriction and tourist places/resorts located at higher altitude.

The Himachal Pradesh Tourism Development and Registration Act, 2002: It is an Act to re-enact a law relating to registration of persons engaged in tourist trade, constitution of the Tourism Development Board and other matters connected therewith. The provisions of this Act are not applicable (i) to premises used for public purpose of charitable nature or to any class of premises used for such purpose; (ii) to premises held by a public trust for a religious or charitable purpose and let out at a nominal rent; (iii) to premises held by a public trust for a religious or charitable purpose and administered by a local authority; and (iv) to a rest house, *dak bungalow*, circuit house, inspection hut, or any institution or premises managed or run by the Government or a local authority. Under Subsection (n) of Section 3, Chapter 1 of the Act, tourism related infrastructure and services are defined. The term 'tourism unit' means any establishment providing facilities and services to the tourists and includes hotels, resorts, motels, time share units, apartments, houseboats, motor caravans, guest houses, *yatri niwas*, restaurants and bars, amusement parks,

theme parks, water sports centres, aero-sports centres, golf courses, handicraft village complexes, camps, river cruises, lake cruise projects, light and sound shows, adventure sports complexes, training institutes for adventure sports or tourism industry doing business for monetary consideration and any other type of establishment as may be notified by the Government from time to time.

This Act defines the functions of Tourist Development Board under Section 8 of Chapter II. Some of the functions of the board include (a) undertaking improvement in the tourist areas to the extent possible within the resources of the Board; (b) undertaking income generating projects for the benefit of tourism industry/tourists in general; (c) undertaking human resource development effort for the development of sustainable tourism industry in the State; (d) taking steps to motivate the private sector to encourage the tourists to visit places of religious and cultural importance, high mountains and other areas of alluring natural beauty by making use of existing physical infrastructure related with tourism in an organised and effective manner; (e) giving priority to rural tourist destinations, while developing new tourist destinations and consolidating tourism infrastructure and facilities and motivating local rural community to undertake various activities for rural tourism development ; (f) mobilising investment for infrastructure building and development of new tourist destinations; (g) protecting and promoting religious places of tourist interest and extending facilities and services in such places of religious and cultural importance for attracting more tourists and for developing religious tourism; (h) developing and promoting wildlife and eco-tourism; (i) issuing guidelines to Tourism Development Council.

Section 17, Chapter III of the Act states the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the function of the council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spot, environmental upgradation etc.; assist the local body in maintaining sanitation and infrastructure facility at the tourist spots regulate the construction, expansion, maintenance and operation of all tourism units and allied activities, prepare a tourism master plan for its area and all tourism units and establishment shall conform to the master plan.

Himachal Pradesh Tourism Development Corporation (HPTDC), established in 1972, has been mandated to develop tourism infrastructure and extend tourists facilities in the State of Himachal Pradesh. It provides tourism services including accommodation with online booking facility, catering, transport etc. In Shimla, HPTDC is responsible for (a) development of tourism infrastructure (b) operation and maintenance of lift and (c) information kiosk.

The Act provides: Registration of the tourism unit; registration of the travel agent or guide; registration of the adventure sports operator; issue certificate of registration of the tourism unit, travel agent, guide, and adventure sports operator.

The Government of Himachal Pradesh has constituted Tourism Development Council for Shimla and Mandi under Himachal Pradesh Tourism Development and Registration Act 2002. The functions of Tourism Development Council are to provide and maintain tourism related services; assist the local body in maintaining infrastructural facilities at tourist spots; build and maintain tourism and recreational facilities, which may enhance the tourism value of the area; prepare tourism master plan for the area; and maintain and operate a tourism destination fund.

The council can also raise resources for the development of infrastructure and facilities by way of fees, cess etc. However, tourism destination fund has not been established for Shimla yet.

Besides, Tourism Development Council for Manali and Kullu district has also been constituted vide notification no. TSM F3-2/2003-I dated 7.7.2004

The Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This Act prevents throwing or depositing non-biodegradable garbage in public drains, roads and places open to public view and "to regulate the use of non-biodegradable material" in the State of Himachal Pradesh.

Section 3 prohibits throwing of non-biodegradable garbage or bio-degradable garbage in non-biodegradable bag or container in any drain, ventilation shift, pipe and fittings, connected with the private or public drainage works. Section 4-A imposes restriction or prohibition on the use of certain things manufactured from non-biodegradable material. Section 4 states specific provision for placement of receptacles and places for depositing non-biodegradable garbage.

The State Government has taken a cabinet decision to ban plastic altogether in the State with effect from 15th August 2009 under this Act.

The Himachal Pradesh Aero Sports rules, 2004: This Act regulates aero sports operations in Himachal Pradesh. It defines the procedure for applying for aero sport operations; registration and qualifications of operator for aero sports; registration and qualifications of the pilot/guide/instructor/tandem pilot; establishment of the regulatory committee and its function; equipments required for carrying out operation and medical facilities and other facilities to be available during operation.

Under Subsection 4 of Section 12, Chapter III of these rules, it is stated that the operator shall keep the environment clean. In case any operator or participant or guide is found not adhering to the environment guidelines, his permission will be suspended and a minimum fine of Rs. 5,000/- shall be charged.

The Himachal Pradesh River Rafting Rules, 2005: These rules regulate river rafting in the State. Under these rules, 'operation' means a river rafting trip undertaken or to be undertaken. 'Season' for the purposes of these rules means whole of the year excluding the period from 15th July to 15th September during which no river rafting operation is permitted.

These rules define procedure of application for river rafting; requirement procedures; registration and qualifications of operator for river rafting; registration requirements and procedure and qualifications of the guide; equipments required for carrying out operation; and medical and other facilities to be available during operation. Subsection 3, under Section 12 of Chapter III of these rules prescribes that the operator shall keep the environment clean. In case any operator or participant or guide is found not adhering to the environment guidelines, his license will be suspended and a minimum fine of Rs. 5,000/- shall be charged.

Himachal Pradesh Climbing/Trekking Porters (Regulation of Employment) Act, 1977 (Act No. 4 of 1978): This Act regulates the supply of porters to the climbing/trekking parties visiting Himachal Pradesh. Item b and d under Section 2 of these rules defines 'employer' as the person, who has ultimate control over the affairs of the expedition; and when the affairs of any expedition are entrusted to any person (whether called a managing agent, manager, superintendent or by any other name) such other person shall be deemed to be employer in relation to that expedition; 'porter' means a person employed to assist the climbing/trekking parties visiting Himachal Pradesh in the operations connected with climbing the peaks, for hire or reward, whether directly or through any agency, to do any work skilled/unskilled or manual. This work could include maintenance of cleanliness and garbage disposal at camp sites or other places.

The Himachal Pradesh Aerial Ropeways Act, 1968 (Act No. 7 of 1969): This is an Act

to authorize, facilitate and regulate the construction and working of aerial ropeways in Himachal Pradesh. Under article 29 of Chapter X of this Act, there is a provision of protection of waterways. No promoter shall, in the course of the construction, repair, working or management of an aerial ropeway, cause any permanent injury to any public road, railway, tramway or waterway, or obstruct or interfere with any waterway.

Notification No. FFE-B-F-(2)-72/2004-PT-II, August 2009: Department of Forests states that Catchment Area Treatment plan size would cover the outlay for all components/treatment measures and special provisions e.g. payments for Eco-tourism.

Himachal Pradesh Forests (Protection from Fire) Rules, 1999: These rules are applicable throughout the year except for the period from 1st of July to 13th of September. The rules specify measures related to prohibition of kindling of fire. Rules specify restrictions on the collection and stacking of inflammable forest produce or inflammable material outside the boundary of or in the forest. Rules also specify precautions to be taken at camping places.

The Himachal Pradesh Fisheries Act, 1976 (Act No. 16 of 1976): This Act provides for matters relating to fisheries in Himachal Pradesh. Under Article 3 of this Act, there are rules, which may (a) prohibit or regulate (b) the erection and use of fixed engines; (c) the construction, temporary or permanent of weirs, dams and bunds; and killing of fish by diversion of natural waters; and (d) prohibit the destruction or attempt to destroy fish by gun, spear, bow and arrow or like instrument or pollution of waters by trade effluents; (e) prescribe seasons in which the killing or catching or sale of any fish of any prescribed species shall be prohibited; (f) prohibit fishing in any specified water for specified period.

Article 7 of these rules also describes punishment for destruction of fish by poisoning water; punishment for possession of dynamite and other explosive substance to be used for killing the fish and punishment for killing or catching fish during prohibited season.

The Indian Treasure-Trove (Himachal Pradesh Amendment) Act, 1972 (Act No. 16 of 1972): This Act seeks to amend the Indian Treasure-Trove Act, 1878 (Central Act No.6 of 1878) in its application to the State of Himachal Pradesh. Under this Act, the State Government may, on application, allow any person to discover a treasure on such terms and conditions as it may deem fit. It may acquire or divide the treasure to the parties as described under Sections 5, 6, 7 and 8 of the Act.

The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act No. 32 of 1976): This Act provides for the preservation of ancient and historical monuments, archaeological sites and remains, other than those of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

Section 2 of this Act defines 'Ancient and Historical Monument', 'Antiquity' and 'Archaeological Sites and Remains'. This Act further defines the meaning of 'Maintain' 'Protection' and 'Retraction' on 'Enjoyment of Property Rights' in Protected Areas. These safeguards have direct relationship with the preservation of environment and pollution control. 'Maintain' includes the fencing, covering in, repairing, restoring and organising of a protected monument; and securing convenient access to maintain the monument.

Section 16 of this Act states the measures taken for the protection of place of worship from misuse, pollution or desecration. A protected monument maintained by the Government under this Act, which is a place of worship or shrine, shall not be used for any purpose inconsistent with its character.

Section 19 of this Act describes restrictions on enjoyment of proprietary rights in protected areas. No person, including the owner or occupier of a protected area, shall construct any building within the protected area or carry on any mining, quarrying, excavating, blasting, or any operation of a like nature in such area or utilise such area or any part thereof in any other manner without the permission of the Government.

Section 30, Subsection 1 of this Act describes provision of penalties for whoever destroys, removes, injuries, alters, defaces, imperils or misuses a protected monument or removes from a protected monument any sculpture, carving, image, bas-relief, inscription or other like objects.

The Himachal Pradesh Hindu Public Religious Institutions and Charitable Endowments Act, 1984 (Act No. 18 of 1984): This Act seeks to provide for the better administration of Hindu Public Religious Institutions and Charitable Endowments and for the protection and preservation of properties appertaining to such institutions and endowments. Section 2 of Chapter 1 defines (a) 'Charitable Endowments' as all property given or endowed for the benefit of, or used as of right by the community or any section thereof for the support or maintenance of objects of utility to the said community or section, such as *sarais*, rest-houses, *pathshalas*, schools and colleges, houses for feeding the poor and institutions for the advancement of education; medical relief fund and public health or other objects of nature and includes the institutions concerned; (f) 'Hindu Public Religious Institution' means a *math*, temple and endowment attached thereto or a specific endowment, established with a religious object for a public purpose.

The Himachal Pradesh Hindu Public Religious Institutions and Charitable Endowments Rules, 1984: Section 7 of these rules states that in case of damage to or encroachment on the immovable property, the trustee or his authorised agent shall take all necessary steps required by law and report the matter to the Commissioner.

Section 15 of these rules states that repairs of temple buildings will be affected in consultation with the Department of Language, Art and Culture, Himachal Pradesh Government, if it is more than 100 years old.

Section 16 of these rules states that it should be the duty of the trustee or *pujari* to take all necessary measures as directed by the Commissioner from time to time for the preservation and security of idols and images in temples.

The Himachal Pradesh Town and Country Planning Act, 1977: This Act seeks to make provision for planning and development and use of land; make better provision for the preparation of development plans and sectoral plans with a view to ensuring that town planning schemes are made in a proper manner and their execution is made effective; constitute the Town and Country Development Authority for proper implementation of Town and Country Development Plan; provide for the development and administration of special areas through the Special Area Development Authority; and make provision for the compulsory acquisition of land required for the purpose of the development plans and for connected purposes.

The Act mandates the preparation of development plan, regional plan, sector plan and tourist development schemes. The development of these plans mandates (a) allocation of land to purposes such as residential, industrial, agricultural or for forests or mineral exploitation; (b) reservation of open spaces for recreational purposes, gardens, tree belts, and animal sanctuaries; (c) access or development of transport and communication facilities, such as roads, railways, waterways, and the allocation and development of airports; (d) requirements and suggestions for development of public utilities such as water supply, drainage and electricity; (e) allocation of

areas to be developed as 'Special Areas' wherein new towns, townships, large industrial estates or any other type of large development projects may be established; (f) landscaping and the preservation of areas in their natural state; (g) measures relating to the prevention of erosion, including rejuvenation of forest areas; (h) proposals relating to irrigation, water supply or flood control works.

A development plan shall consist of (i) areas for residential, industrial, commercial or agricultural purposes; (ii) indicate open spaces, parks and gardens, green belts, zoological gardens and play-grounds; (iii) lay down the pattern of National and State Highways connecting the planning area with the rest of the region, ring roads, arterial roads and other major roads within the planning area; (iv) project the requirement of the planning area of such amenities and utilities as water, drainage, electricity and suggest their fulfillment; (v) lay down the broad-based traffic circulation patterns in a city; (vi) indicate measures for flood control, prevention of air and water pollution, disposal of garbage and general environmental control.

Section 27, Chapter VI of this Act mandates prohibition of development without permission. This prohibition is applicable for carrying out work for the improvement or maintenance of a highway, road or public street by the Union or State Government or an authority established under this Act or by a local authority having jurisdiction, provided that such maintenance or improvement does not change the road alignment contrary to the provisions of the development plan. This is also applicable for the purpose of inspecting, repairing or renewing any drain, sewers, mains, pipes, cables, telephone or other apparatus including the breaking open of any street or other land for that purpose and for excavation or soil shaping in the interest of agriculture.

Section 31, Chapter VI of this Act specifies grant or refusal of permission to development. Section 37, Chapter VI specifies power of revocation and modification or permission to development. Section 38, Chapter VI specifies penalty for unauthorised development or for use otherwise than in conformity with the development plan.

Appendix 1 under rule 10-A & 10-B defines guidelines for permission to change land use, or to develop land or to sub-divide the land in areas where land use is frozen and interim development plan or development plan has not been prepared. Section 14 in the appendix states that change of land use should not disturb the ecology.

This Act prescribes that (1) change of land use or the development of land shall be made in such a manner that natural profile of the land is least disturbed. (2) Where, it is essential to develop a plot by cutting, it shall be the responsibility of the plot owner to provide, according to the engineering specifications, retaining and breast walls so that such cutting of natural profile of the land may not harm the adjoining uphill side properties. However, cutting of natural profile shall not exceed more than one storey (3 metres in any case, having a provision of diaphragm wall for step housing). (3) Change in the use of land or the development of land shall be made in a manner so as to achieve maximum air, light and sun where it is needed the most.

The Shimla Road Users and Pedestrians (Public Safety and Convenience) Act, 2007: This Act seeks to restore the sanctity of the Shimla Mall Road by preventing its use as a thoroughfare and to provide for regulation of vehicular traffic in the interest of public safety and convenience on the sealed and restricted roads of Shimla town to prevent annoyance and injury to pedestrians. Under Sections 5, 9 and 10 of this Act, vehicles shall not ply on the sealed or restricted roads at a speed of more than 20 km per hour. The pass of a vehicle detected violating the speed limit shall be liable to be cancelled. Further, copy of a valid 'Pollution under Control' Certificate issued by the concerned authority is required for issuing and renewal of the pass. A tourist visiting Shimla town may apply for a restricted road

tourist pass at such tourist facilitation centres as may be specified by Home Department by a notification from time to time.

Different programmes, schemes and projects related to the State's context are given below.

'Product/Infrastructure Development for Destinations and Circuits', Ministry of Tourism, Government of India: There are two sub-schemes, which are described below.

(i) Major Destinations and Circuits Development: The focus under this revised scheme will be on the improvement of existing product and developing new tourism products according to global standard. It will also focus on Integrated Infrastructure Development of the tourist sites. The aim would be to provide all infrastructure facilities required by the tourists within such destinations and circuits. Master Planning of these destinations and circuitswillbeundertakensoastodevelop them in an integrated and holistic manner.

The Ministry of Tourism would bear 100 percent of the project cost based on the project plan and estimates submitted, excluding the items, which are the exclusive responsibility of the State Governments. Government of India's contribution would be capped at Rs. 25 *crores* for destination development and Rs.50 *crores* for circuit development for identified major destinations and circuits based on tourist traffic.

(ii) Rural Tourism Infrastructure Development: Under this Scheme, thrust will be on promoting village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions. Key geographic regions would be identified for development and promotion of rural tourism. The implementation would be done through a Convergence Committee headed by the District Collector. Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be on tapping the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/Departments of the Government of India.

The thrust here would be to achieve convergence between different schemes of the Government of India and the State Government. It should be ensured that at least 50 percent of the project should be implemented through achieving convergence of different schemes. Assistance up to Rs. 3.00 *lakhs* would be provided to the State Government for engaging an expert for preparing the project report.

State Tourism Development Corporations are entrusted with the responsibility of focal point for formulating and implementing rural tourism projects in consultation with District Collectors/Deputy Commissioners to ensure convergence from other *yojnas*, schemes and allocations for broader/integrated development at the site to benefit local communities.

Scheme of Central Financial Assistance for Information Technology Projects, Ministry of Tourism, Government of India: The aim of these initiatives have been to a) bring improvement and efficiency at Government of India Tourist Offices and the Ministry Headquarters; b) provide improved and quality tourist information to tourists and c) provide improved tourist facilitation.

The scheme aims to encourage the State Tourism Departments to take major IT initiatives for improved tourist information and facilitation as well as marketing and publicizing their tourist products. Under this scheme, assistance up to 50 percent of the IT project is given to the State/UT Governments.

Scheme of Financial Assistance to States for Organising Tourism Related Events, Ministry of Tourism, Government of India: Under this scheme, the Ministry of Tourism provides financial assistance to States/Union

Territories for organizing events for the promotion of tourism. An event can be a fair, festival, show, seminar, conclave, convention relating to tourism and has a national/international impact and will build brand equity for India. The Ministry of Tourism will provide financial assistance for only one event per States/Union Territories in one financial year, subject to the availability of funds and the relevance of the event, such as being a national level tourist attraction. The financial assistance by the Ministry of Tourism will not exceed Rs.15 *lakhs* for each event.

The activities permissible under financial assistance would include creation of semi-permanent structures, seating arrangements, lighting, sound, remuneration to artists, lodging and boarding, production of posters, pamphlets, advertisements in newspapers, hiring of space, transportation etc. The State Government organising the event should contribute at least 50 percent of the total expenditure involved.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Ministry of Tourism, Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance, Government of India. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria:

(a) The project shall be implemented i.e. developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open and competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the Empowered Committee may relax this eligibility criterion.
(b) International convention centres and other tourism infrastructure projects; provided that the Empowered Committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total project cost.

Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 *crores* (Rs. One Hundred *Crores*) for each project may be sanctioned by the empowered institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *crores* (Rs. Two Hundred *Crores*) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 *crores* may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

Revised Scheme of Assistance for Large Revenue Generating Projects, Ministry of Tourism, Government of India: Large revenue generating project, which can be admissible for assistance under this scheme, should be a project, which is also a tourist attraction, or used by tourists and generates revenue through a levy of fee or user charges on the visitors. Projects like tourist trains, cruise vessels, cruise terminals, convention centres, golf courses open for both domestic and international tourists health and rejuvenation facilities and last mile connectivity to tourist destinations (air and cruise including heli tourism) etc. would qualify for assistance.

Hotel and restaurant component will not be eligible for assistance under the scheme either on a stand-alone basis or as an integral part of some other project. However, catering facility (not open for general public), as an integral part of the project to meet in-house needs could be eligible for assistance.

The projects promoted by Public Sector Undertakings, agencies, or autonomous bodies of Central/State Governments as well as projects promoted by Private Sector /PPP projects recommended by the State Governments/UT Administrations will be eligible for assistance.

The projects selected for assistance under this scheme would not be eligible for subsidy from other schemes of the Central or State Governments. Similarly, the projects, which have already availed subsidy/financial assistance from any other scheme of the Central or State Government, would not be eligible for Government of India assistance under this scheme.

A Special Purpose Vehicle would have to be set up by the implementing partners in case a private party is promoting the project on its own or in PPP mode, prior to the consideration of their project under this scheme. However, where the promoter of the project is a State PSU, agency, autonomous body or Central Government PSU, agency or autonomous body, a separate SPV need not be required. In both the cases, a separate project management group would be required.

Grant-in-aid for preparation of Detailed Project Report (DPR) would be admissible at 50 percent of the actual cost subject to a maximum of Rs. 25 *lakhs* per project. No Grant-in-aid would be admissible for the preparation of feasibility report.

The subsidy under the scheme will have a cap of Rs. 50 *crores* subject to a maximum of 25 percent of total project cost or 50 percent of equity contribution of the promoters, whichever is lower.

Scheme of Financial Assistance to the IHMS/FCIS/IITTM/IT IS/Polytechnic Institutes/Universities/Government Colleges/Government Vocational Schools/PSUs, Ministry of Tourism, Government of India: The Ministry of Tourism extends financial assistance for the setting up and up-gradation of Institutes of Hotel Management & Catering Technology & Applied Nutrition (IHMs), Food Craft Institutes (FCIs) in the country. The Indian Institute of Tourism & Travel Management (IITTM) and National Council of Hotel Management & Catering Technology (NCHMCT) are also eligible for this assistance. The purpose underlying these efforts is to create institutional infrastructure that could foster and facilitate professional education and training specific to tourism, travel and hospitality industry.

A society created by the Central/State Government/UT Administration to manage an IHM shall be eligible for central assistance. The two autonomous societies created by the Central Government, namely the Indian Institute of Tourism & Travel Management and the National Council of Hotel Management & Catering Technology shall also be eligible for central assistance. Central assistance shall be admissible for the setting up of an IHM; and centres/branches of IITTM/NCHMCT/existing IHMs.

Society created by the Central/State Government/UT Administrations to manage an FCI shall be eligible for central assistance.

Guidelines for Project Approval and Classification of Time Share (TSR) Resorts, Ministry of Tourism, Government of India: With the aim of providing standardised world class services to the tourists, the Government of India, Ministry of Tourism has a voluntary scheme for classification of fully operational Time Share Resorts in the Five Star, Four Star and Three Star categories. The Hotel and Restaurant Approval and Classification Committee (HRACC) inspects and assesses the TSR based on facilities and services offered.

Scheme of Capacity Building for Service Providers, Ministry of Tourism, Government of India: The Ministry of Tourism, Government of India plans to

provide education, training and certification to tourism service providers at every level through the CBSP Scheme. The main objectives of this initiative are to train and up-grade manpower at every strata of service in order to i) capitalise on the vast tourism potential of the country to the fullest; and ii) provide professional expertise to the local populace as well as create fresh opportunities for employment generation in the tourism sector both in urban as well as rural areas.

Training programmes for the following shall be covered under the Guidelines including development of a system for Certification:

1. Skill Development in general for fresh candidates;
2. Specialised skill development, including language courses for fresh as well as existing service providers;
3. Training of teachers, administrators and planners;
4. Basic skill up-gradation in general for existing service providers;
5. Training of Trainers programmes;
6. Awareness Programmes;
7. Awareness of tourism benefits/knowledge in the rural areas.

Ministry of Tourism**,** India Tourism Offices, Institutes of Hotel Management and Food Craft Institutes including such institutes approved by the AICTE, Indian Institute of Tourism & Travel Management, NCHMCT, Tourism Departments of State/UT Governments, State Tourism Development Corporations, India Tourism Development Corporation (ITDC), State/Centre Training/Academic Institutions.

Capacity Building for Service Providers Scheme, Ministry of Tourism, Government of India: The Capacity Building for Service Providers Scheme (software) aims to develop a sustainable rural tourism product, converging with the ministry's rural tourism scheme through tourism awareness, capacity building for tourism/hospitality services, gender equity, *gurukul*, environmental care and marketing. The scheme will thereby also support rural livelihoods, enabling low income rural communities to articulate their skills for experiential visits by domestic and international visitors. The permissible activities at the selected sites fall into broad categories, which will together form the detailed work plan, created with local community participation, initiated through stakeholder meetings. These include (1) baseline survey of the local community site; (2) enhancing local community awareness of the tourism process; (3) gender sensitisation; (4) capacity building/design inputs related to art and craft skills, cultural and natural heritage; (5) *gurukul* process; (6) capacity building for various aspects of visitor handling; (7) convergence with other *yojanas*/schemes in the site; (8) environment care and access to cleaner technology with local material, local skills and local traditional styles; and (9) marketing convergence including travel trade for domestic and international visitors.

The various 'software' items covered under the above broad categories of permissible activities would come from an indicative list consisting of workshops for preparatory activities at site: sensitisation, awareness-building, social mobilisation and interpretation; establishing operational norms for visitor satisfaction; training for tourism service capacity building; training for visitor handling skills/local hospitality-guides, reception, lodging, cuisine; tourism product development and integration of target groups with tourism supply chain; packaging of culture and craft-based tourism products; building capacity of village groups for entertainment, culture, festivals, history, literature and special strengths including nature and heritage; gender sensitisation/awareness building; facilitation of common facility creation (*gram jharokas*)– on village/community common property resources and facilitation of *vishram sthal* construction using traditional skills, knowledge, local material and in accordance with regional/zonal/local norms; facilitating setting up of *gram kala kendras*/craft museums, centres for local music, song, dance and drama, street theatre etc. and in accordance with regional/zonal/local norms; setting up

marketing model support-brochures, postcards, websites, developing material in local language, imaginative use of mediaetc. (domestic and international); interface with market mechanism; imparting of skills for targeted disadvantaged groups; environment safeguards and assessment of destination lifecycle; and facilitation of cleaner technology.

Professional Services/Market Research Scheme, Ministry of Tourism, Government of India: This scheme seeks to undertake the following by using professional services from consulting agencies: (i) tourism related Surveys, Studies, Plans, Market Research etc. for making available relevant data/ information/ report/ inputs to the Department for policy making and planning purposes; and (ii) Feasibility Studies and Detailed Project Reports for specific tourism projects.

The Scheme would mainly cover the following activities:

(i) Surveys/Master Plans/Studies to be undertaken by the Department of Tourism directly as per their own requirements or for State Government / Stakeholders / Tourism Industry; (ii) project specific DPRs / Feasibility Studies etc. for Circuit / Destination, Development for State Governments / UT Administrations through professional consultants to be considered under the Scheme of Product Infrastructure, Development for Destination and Circuits, pertaining to the States of North East, Sikkim and J&K. Similar requests from other States would be considered on need basis; (iii) collection, compilation, analysis and publication of statistical data; (iv) meetings/conferences etc. organised for the purpose of getting inputs from Experts, State Governments, Industry, Intellectuals etc. for the development of tourism; (v) funds will not be sanctioned for the preparation of DPR/Feasibility Report for Hotels, Tourist Resorts etc. However, Ministry of Tourism may consider sanctioning of Surveys for determining the requirement of hotel accommodation etc. in the country.

For the preparation of DPRs/Feasibility Studies etc. for projects under the Scheme of Product/Infrastructure Development for Destinations and Circuits, a maximum assistance of Rs. 10 *lakhs* will be provided. For the preparation of DPRs/Feasibility Reports for projects falling under the other Schemes like Large Revenue Generating Projects (LRGP), the financial limits as prescribed in the respective Scheme will be applicable.

Guidelines for the Scheme of Market Development Assistance for Promotion of Domestic Tourism, Ministry of Tourism, Government of India: The emphasis of this scheme is to motivate travel agents/tour operators and, especially those who are yet to promote India to include tour packages to various destinations, preferably, less popular and unexploited destinations in the country in their marketing programme; to encourage domestic tourists to visit such unexploited tourist destinations in various States and thereby; project India as an attractive, multi dimensional tourist destination; to familiarise travel agents/tour operators/hoteliers about new tourism products and latest developments in the field of tourism.

The approved tourism service providers would be provided financial assistance on travel expenses by air only subject to a ceiling of Rs. 30,000/- per trip (to and fro) of the airfare for undertaking such tours to other destinations and circuits.

Scheme for Building Grants to Cultural Organizations by Ministry of Culture, Government of India: The objective of the Scheme is to give grants to Voluntary Cultural Organizations for the construction of their building and purchase of specific items or equipments. Requests for additions to and renovations of the existing buildings will not be covered under the scheme, unless the proposals are specifically for modernizing / upgrading / extending auditoria, studios, music halls, theatres etc. The scheme covers all organizations working in the field for the promotion of culture such as dance, drama,

theatre, music, fine arts, indology and literature. Religious institutions, public libraries, museums, schools, universities, institutions fully funded by Central Governments / U.T. Administrations / Municipalities / Corporations will not be eligible.

Building Grant by the Ministry of Culture, Government of India: The maximum assistance admissible to an organization for the construction of its building will be Rs. 15 *lakhs*. Cost of the land (not marked value) and development charges borne by the organization shall be accounted as matching share. The maximum assistance admissible to an organization for purchase of equipments will be Rs. 2.50 *lakhs*.

Development of Buddhist-Tibetan Culture and Art by Ministry of Culture, Government of India: The objective of the scheme is to give financial assistance to the Voluntary Buddhist/Tibetan Organizations including Monasteries engaged in the propagation and scientific development of Buddhist/Tibetan culture and tradition and research in related fields. Only those organizations, which are mainly devoted to Buddhist/Tibetan studies and have been functioning at least for the last three years, will qualify for applying for a grant.

Financial assistance may be given for all or any of the items listed below up to a maximum of Rs. 5.00 *lakhs* per year for any single organization. Financial assistance of Rs 1,50,000 per annum may be given for repairs, and Rs. 1,25,000 per annum for restoration, renovation of ancient Monasteries etc., which are of historical and cultural importance. For the award of fellowships/scholarships; holding special courses; purchase of books, documentation, cataloguing, etc., Rs.7,00,000/- may be given per annum. Financial assistance of Rs 5,00,000/- per annum may also be given for the construction of hostel building; and salary of teachers, where the organization is running a school for imparting monastic education.

The maximum grant admissible to an organization would be 75 percent of the total expenditure to be incurred on any item subject to maximum fixed ceiling. The remaining 25% expenditure or more should be met by the State Government/U.T. Administration, failing which the grantee organisation could contribute the amount from their own resources.

Scheme for Providing Grant-in-aid to Voluntary Organizations for Organizing Centenaries/Anniversaries, Ministry of Culture, Government of India: This grant is awarded to highlight salient aspects of the life and times of important personalities in order to infuse in the public, particularly the young, the spirit of these great leaders. This grant is awarded to provide financial assistance to registered Voluntary Organizations and State and National bodies for achieving the objectives of the Scheme, grants not exceeding rupees one *lakh* to any Voluntary Organization for appropriate programmes under the scheme, grant not exceeding Rs. 40,000/- (Rupees forty thousand only) in case of anniversary celebrations of jubilee years i.e. 125th, 150th, 175th and so on. Grant will not exceed 75 percent of the total expenditure. The balance of 25 percent of the expenditure is to be borne by the organization.

Cultural Complex by Ministry of Culture, Government of India: Setting up of multi-purpose cultural complexes under which financial assistance is provided to an autonomous body created by the State Government to set up art and cultural complexes. Cultural complexes for children are considered on a case to case basis. These multi-purpose art and cultural complexes will work as Centres of Excellence in creative arts and/or impart training to young talent. They will serve as major resource centres for the region. The basic infrastructure may include any or all of the following: auditoria, library, museum, exhibition, art gallery, open air theatre, recording studios etc. Research and documentation relating to preservation and dissemination of culture will also be supported.

Under the scheme, financial assistance is provided to an autonomous body set up by the State Government and registered under the Societies Registration Act, 1860.

An autonomous body registered under the Societies Registration Act 1860 and set up by the State Government will be eligible. The concerned State Government will make land available free of cost. The State Government's nominee and also nominee of the Government of India will be on the Board of Management to administer and run the complex.

A sum of up to Rs 1.00 *crore* (Rs. One *Crore*) will be given as a one time grant by the Government of India to the concerned autonomous body. All recurring expenditure will be met by the State Government. The grant will be released in four equal installments based on the progress of the project.

Scheme for Financial Assistance for 'Setting Up, Promotion and Strengthening of Regional and Local Museums', Ministry of Culture, Government of India: The objective of the scheme is to provide financial assistance for setting up of new museum by the society or autonomous body under the State Government and to promote the strengthening and modernization of existing museums at the regional, State and local level and to further strengthen the museum movement in the country.

Financial assistance will be given for professional development of museums managed by Voluntary Organizations, institutions, societies, trusts, local bodies etc. including universities and colleges registered under the Registration of Societies Act of 1860 (XXI) or under any other law being in force at that time as well as those managed by the State Government. The broad range will include museums for the promotion of: a) antiquities; b) numismatics; c) paintings; d) ethnological collections; e) folk art; and f) others including art & crafts, textiles, stamps etc.
Society or autonomous body under the State Government having land in its own name can apply for setting up of new museums. For all purposes, grant would be in the ratio of 80:20. A maximum of and up to 80 percent of the estimated cost would be provided by the Central Government and a minimum of 20 percent and balance, if any, will be met by the State Government/institution, as the case may be.

Grant-in-aid to Voluntary Organisations /Societies for the Development and Maintenance of National Memorials, Ministry of Culture, Government of India:
This Grant-in-aid is awarded to commemorate the role of eminent national personalities, who have contributed and played a historic role in the history of India; to highlight their lives and activities as well as the relevance of their ideas to the Indian heritage; to interpret and convey the cultural and spiritual values they stood for; and to create an awareness of the contribution of such personalities to the nation, particularly by keeping the younger generation informed. The scheme covers financial assistance for memorials set up on the initiative of the Central Government, the State Government and/or civic bodies, and Voluntary Organisations.

Preservation and Development of Cultural Heritage of the Himalayas: The objective of the scheme is to promote, protect and preserve the cultural heritage of the Himalayas for which financial assistance will be provided to institutions and Voluntary Organisations. The scope of the scheme would include: a) study and research of all aspects of cultural heritage; b) collection of art and craft objects and documentation of cultural artifacts including folk music, dance and literature; c) dissemination through audio-visual programmes of art and culture; d) training in traditional and folk art; and e) assisting and setting up of museums and librariesetc.

The responsibility for drawing up a long-term programme for the development of Himalayan culture will, at present, be entrusted to *Rashtriya Manav Sangrahalaya*, an autonomous undertaking under the Department of Culture.

They will call meetings of the experts and representatives of the institutions involved in the preservation of Himalayan culture including folk culture to draw up a long-term plan. This organisation will also coordinate measures for the promotion and preservation of Himalayan culture by various organisations and institutions in consultation with Zonal Cultural Centres, representatives of selected organisations, Anthropological Survey of India etc.

For an individual project, the quantum of financial assistance would normally not exceed Rs. five *lakhs*. The amount of financial assistance could be increased in exceptional cases and on the recommendation of the Expert Committee to be set up by the Department of Culture.

Projects and programmes implemented by the Department of Tourism and Civil Aviation, Government of Himachal Pradesh are given below:

Professional & Special Services for Developing New Sites in Himachal Pradesh: The Department of Tourism and Civil Aviation, Government of Himachal Pradesh (GoHP) has a few sites available for setting up tourism units in Himachal Pradesh. In order to prepare detailed project reports for these sites, services of consultants are required. The work under this scheme is a continuous process and funds are required to incur the recurring expenditure on exploring new sites and for the preparation of DPRs.

Tourist Accommodation/Infrastructure Development: The Department of Tourism and Civil Aviation, GoHP has been improving/constructing tourist infrastructure like accommodation, wayside amenities, signages, parking places, tourist facilities, entertainment facilities etc. at important tourist places under the Government of India schemes during the course of the annual plan.

Training Programmes, Department of Tourism and Civil Aviation, Government of Himachal Pradesh: Training plays an important role in developing the tourism sector in the State. The Department of Tourism, Government of Himachal Pradesh has been imparting various training programmes, like water sports, trekking guide, tourist guide, entrepreneurship development, human resources development etc. for unemployed youths in order to provide them better employment opportunities in tourism related activities. The Department has also been providing training to the police personnel, taxi drivers, bus drivers, *pithus* and *dhaba* operators with a view to build capacity.

Promotion & Publicity, Department of Tourism and Civil Aviation, Government of Himachal Pradesh: The Department of Tourism and Civil Aviation plays a proactive role in the promotion of State by way of releasing advertisements in the print and electronic media; participating in national and international tourism fairs; printing of tourist literature etc. The Department also organises various events during the off season in order to attract more tourists. To attract the tourists, the Tourism Department has been organising events, like apple festival, vintage car rally, mountain biking, marathon, paragliding, pre-world cups, rafting cups and golf tournaments etc.

Hospitality Programme, Department of Tourism and Civil Aviation, Government of Himachal Pradesh: The Department has been providing hospitality to prominent persons related to tourism and to host meets of travel agents, travel writers, national/international events and road shows etc. for the promotion of tourism. This calls for the provision of hospitality in respect of boarding, lodging and transportation.

Other Schemes, Department of Tourism and Civil Aviation, Government of Himachal Pradesh: Schemes for providing Survey and Civic amenities:

(i) Surveys: The Department has been conducting economic surveys for appropriate

planning and adequate and accurate database. The above scheme is a continuous process.

(ii) Civic amenities: For the convenience of tourists, the Department provides basic facilities, like toilets, parking places, paths, development of parks and beautification of temples at important tourist places. To undertake activities for providing the facilities, the Department continuously carries out civil works.

Formulation of Long Term Master Plan for Tourism, Department of Tourism Civil Aviation, Government of Himachal Pradesh, 2009-10: The Department of Tourism and Civil Aviation is formulating a Long Term Master Plan for the promotion of tourism in Himachal Pradesh. The Master Plan will comprise various aspects, such as development of tourism infrastructure in the State keeping in view the next 20 year's scenario, development and establishment of sustainable and eco friendly tourism projects, encouragement of eco-tourism and health tourism, promotion and familiarisation of adventure tourism, religious tourism, community participation in tourism activities, implementation of Homestay schemes, setting up of film cities and multiplexes and encouraging the Private Sector to make investments in the tourism sector under Public Private Partnership mode in the State.
The Long Term Master Plan for tourism in Himachal Pradesh is an initiative of the State Government to trigger higher growth of economy through development of tourism along with the creation of a sustainable socio-cultural and physical environment by adopting green ways of sustainable development; create new tourism assets and conservation of existing ones; harness new ways of tapping Eco, Health, Rural, Heritage, Religious, Education, Adventure, Lake and Heli Tourism; enhance the potential of Religious tourism, Lake tourism and suggest strategies to mitigate their problems; identify physical infrastructure needed for tourism development; plan financing and management strategies for proposed tourism projects; identify employment generating activities, which promote tourism and assess employment generation; encourage local community participation and skill development; encourage Private Sector investments in the tourism sector on PPP basis; and make Himachal Pradesh as the most favourite tourism destination for domestic/foreign/high-end tourists.

The Homestay Scheme 2008, Department of Tourism and Civil Aviation, Government of Himachal Pradesh: The aim of this scheme is to provide comfortable Homestay facilities having standardized world class services to the tourists and to supplement the availability of accommodation in the rural tourist destinations. The State Government has introduced Homestay Facilities on the basis of Ministry of Tourism, Government of India's 'Incredible India' Bed and Breakfast scheme. The basic idea is to provide a clean and affordable place for foreigners and domestic tourists alike including an opportunity for foreign tourists to stay with Himachali families to experience Himachali customs and traditions and relish authentic Indian/Himachali cuisine.

The objectives of the scheme are to (a) broaden the stakeholder's base for tourism in the State; (b) take tourism to the rural and interior areas of the State; (c) decongest the urban areas, which cannot support any further tourism load; (d) provide employment and economic values in the interior areas; and (e) the activity shall be ecologically sustainable.

The scheme is operative in the entire rural areas of the State. The District Tourism Development Officer, before registering such Homestay units, must ensure the location, facilities, surrounding environment, hygiene, cleanliness, security, architectural designs and safety of the tourist. The owner of the Homestay unit shall, at all times, maintain the minimum standards of cleanliness, sanitation, quality food etc. The checklist for Approval & Registration of Homestay unit consists of parking with adequate road width; all rooms

should be clean, airy, pest free, without dampness and with outside window/ventilation; comfortable bed with good quality linen and bedding, preferably of Hill design; availability of bathrooms; WC toilet to have a seat and lid and toilet paper; availability of running hot and cold water; water saving taps/shower; well maintained smoke free, clean, hygienic, pest free kitchen; and garbage disposal facilities as per Municipal laws.

2.1 Potable Water Supply

The policies and laws applicable and/or related to the development of the State's water sector along with a brief description of their relevance are listed below. Detailed explanations can be acquired from the websites of relevant Departments and line Ministries, like the Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Urban Development (www.urbanindia.nic.in), and Department of Urban Development, Himachal Pradesh (www.hpurbandevelopment.nic.in).

National Level Policies / Regulations

The National Water Policy, 2002: National level policy addresses major water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. This Policy also states about the use of water, water conservation and quantification of water pollution.

Section 1.2 states that rivers and underground aquifers often cut across State boundaries. Water,asaresource,isoneandindivisible.
Therefore, rainfall, river waters, surface ponds and lakes and ground water are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of project implementation.

Section 14.5 states that necessary legislation is to be made for the preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, such as hydrometeorology; snow and lake hydrology; surface and ground water hydrology; assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; soils and material research; economical designs for water resource projects; sedimentation of reservoirs; prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact; and regional equity.

National Action Plan on Climate Change (NAPCC), 2008: The National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

National Water Mission is part of NAPCC and identifies the strategies and methodologies in respect of (a) Assessment of Climate Change Impact; (b) Changes in Policy, Practices and Institutional Framework; (c) Measures for

Mitigation; as well as (d) Measures for Adaptations. Appropriate monitoring and evaluation mechanisms have also been proposed.

National Water Mission will be mounted to ensure integrated water resource management helping to conserve water, minimize wastage and ensure more equitable distribution both across and within States. The Mission will take into account the provisions of the National Water Policy and develop a framework to optimize water use by increasing water use efficiency by 20 percent through regulatory mechanisms with differential entitlements and pricing. It will seek to ensure that a considerable share of the urban area water needs are met through recycling of waste water and ensuring that the water requirements of coastal cities with inadequate alternative sources of water are met through the adoption of new and appropriate technologies, such as low temperature desalination technologies that enable the use of ocean water.

The National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. This will include enhanced storage both above and below ground, rainwater harvesting, coupled with equitable and efficient management structures.

The mission will seek to develop new regulatory structures, combined with appropriate entitlements and pricing. It will seek to optimize the efficiency of existing irrigation systems, including rehabilitation of systems that have been run down and also expand irrigation, where feasible, with a special effort to increase storage capacity. Incentive structures will be designed to promote water neutral of water positive technologies, recharging of underground water sources and adoption of large scale irrigation programmes, which rely on sprinklers, drip irrigation and ridge and furrow irrigation.

The National Environment Policy (NEP), 2006: The policy recognises the ecological services rendered by water bodies, like lakes and wetlands. The NEP states that wetlands including lakes are under threat from drainage and conversion for agriculture and human settlements besides pollution. The reduction in economic value of their environmental services due to pollution, as well as the health costs of the pollution itself, are not taken into account while using them as a waste dump.

The NEP recommends the development of an action plan for these water bodies, which importantly includes formulation of conservation and prudent use strategies; integration of wetland and lake conservation into sectoral development plans for poverty alleviation and livelihood improvement and formulation of eco-tourism strategies through Multi-Stakeholder Partnership (MSP).

National Urban Sanitation Policy: The National Urban Sanitation Policy urges States to come up with their own detailed State-level urban sanitation strategies and city sanitation plans. It moots the idea of totally sanitized cities and the setting up of a Multi-Stakeholder city sanitation task force to achieve it. Environmental considerations, public health implications and reaching the unserved and urban poor are given significant emphasis in the policy.

The vision for urban sanitation in India, as per the National Urban Sanitation Policy is: All Indian cities and towns should become totally sanitised, healthy, livable good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women. As per issues highlighted in National Urban Sanitation Policy, the following key sanitation policy issues must be addressed.

- **Poor Awareness**: Sanitation has been accorded low priority and there is poor awareness about its inherent linkages with public health.
- **Social and Occupational Aspects of Sanitation**: Despite appropriate legal

framework, progress towards the elimination of manual scavenging has shown limited success. Little or no attention has been paid towards the occupational hazards faced by sanitation workers involved in manual scavenging.

- **Fragmented Institutional Roles and Responsibilities**: There are considerable gaps and overlaps in institutional roles and responsibilities at the National, State, and city levels.
- **Lack of an integrated city-wide approach:** Sanitation investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal.

Notification on Protection and Improvement of Quality of Environment in the Himalayas, 2001: This notification was issued by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986, specifically for environmental protection in the Himalayan States. The activities relate to location planning in urban areas, rainwater harvesting and guidelines for the construction of hill roads.

National Health Policy, 2002: The main objective of this national policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to decentralised public health system by establishing new infrastructure in deficient areas and by upgrading the infrastructure in the existing institutions.

The policy hoped that the independently stated policies and programmes of environment related sectors would be smoothly interfaced with the policies and programmes of the health sector, in order to reduce health risks to the citizens and the consequential disease burden.

This policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognises the significant contribution made by NGOs and other Civil Society institutions in making available health services to the community. It also emphasises the need to simplify procedures for Government – Civil Society interface in order to enhance the involvement of Civil Society in public health programmes.

National Rural Health Mission (2005-12): The National Rural Health Mission (NRHM) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 States including Himachal Pradesh, which have weak public health indicators and/or weak infrastructure. It has, as its key components, a village health plan prepared through a local team headed by the Health and Sanitation Committee of the Panchayat and integration of vertical Health and Family Welfare Programmes and funds for optimal utilisation of funds and infrastructure and strengthening the delivery of primary healthcare. It aims at effective integration of health concerns with determinants of health, like sanitation and hygiene, nutrition, and safe drinking water through a district level plan for health. The major goals of NRHM include reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR), and universal access to public health services, such as water, sanitation and hygiene.

This Mission's Plan of Action has ten components. These components include district health plan, converging sanitation and hygiene, Public-Private Partnership for public health goals. The mission envisages the following roles for PRIs: The Village Health Committee of the *Panchayat* would prepare the Village Health Plan (VHP) and promote inter-sectoral integration. There is also provision of training to members of PRIs.

Environment (Protection) Act, 1986: This is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it, to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection)

Act, 1986, amended in 1991, has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve environment, which includes water, air and land and the inter–relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment (Protection) Act,1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

The Water (Prevention and Control of Pollution) Act, 1974 (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention & Control of Pollution) Act, 1974, as amended 1988, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on the use of streams (includes inland water whether natural or artificial) or wells for the disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or of aquatic organisms.

Chapter 5 of the Act deals with Prevention and Control of Water Pollution. It contains information on the power of the State Government to restrict the application of the Act to certain areas; power to obtain information; power to take sample of effluents and procedures to be followed; submit reports on the result of analysis on samples taken under Section 21; power of entry and inspection; prohibition on the use of stream or well for disposal of polluting matter etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by the State Board; appeals; revision; power of the State Board to carry out certain works; furnishing of information to the State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Water (Prevention and Control of Pollution) Cess Act, 1977 (Amended 1992 and 2003): This is an Act to provide for the levy and collection of cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central and State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines

disposal of municipal solid wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of municipal solid wastes from place to place hygienically through specially designed transport systems, so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for the collection, segregation, storage, transportation, processing and disposal of Municipal solid wastes.

Bio-Medical Waste (Management and Handling) Rules, 1998 (As amended in 2003): Rules apply to all, who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals. Section 4 of these rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.

Environment Impact Assessment (EIA) Notification, September 14, 2006: EIA notification makes an EIA study mandatory for those water sector development projects and River valley Projects that have more than 10000 ha of command area. A water supply project does not require prior environment clearance notification as per EIA notification 2006. However, the potable water requirements and services in Industrial estates/ parks/ complexes/ areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes Building (item 7c) and Construction projects, and Townships and Area Development projects are covered under Item 8 (a) and 8 (b) by the said notification.

EIA Notification 2006: This notification makes it mandatory for eight categories of projects to prepare Environment Impact Assessment and Environment Management Plan for seeking environmental clearance. Area development and construction projects are covered under category 8A and 8B. New tourist resorts/units coming up in the State may fall under this category and require environmental clearance.

State Level Policies / Regulations

State Water Policy: The said policy states that water, as a resource, is one and indivisible: rainfall, river water, surface ponds, lakes and groundwater are all part of one system. In Himachal Pradesh, the availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul and Spiti district to around 3200 mm in Dharamshala, district Kangra. However, in spite of heavy rains and snow during the rainy season and winter, the summer months are periods of water scarcity in many areas, as the flow in the rivers and nallahs is quite low and traditional sources also dry up. Thus, through its Water Policy, the State also has to address the issues of drought management in some areas and flood control in others.

The policy states about the requirement of clear guidelines with respect to water related projects. The planning and implementation of water related projects has many socio-economic aspects and issues, such as environmental sustainability, resettlement and rehabilitation of project-affected people and livestock, public health concerns of water impoundment, dam safety etc.

It states that water resources available to the State should be brought within the category of utilisable resources to the maximum possible extent. Groundwater exploitation for domestic use and irrigation will be promoted wherever feasible and improvising of surface water in pondages for usage during lean periods shall be encouraged.

The policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin so that the best possible combination of options can be selected and sustained."

The policy recommends watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rests with the State. Water may be made available to water short areas by transfer from other areas, including transfers from one river basin to another, based on a State's perspective, after taking into account the area/basin requirements. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

The State level policy deals with the process and quality of drinking water supply and sanitation means in different areas of the State, mostly in rural sectors. The policy links water harvesting practices in households and community. It assigns duties and responsibilities of Panchayati Raj Institutions (PRIs) and Non Government Organizations in source development and water allocation. It stresses on awareness generation for optimal and efficient use of drinking water. Further, the said policy emphasises on non-conventional methods for augmenting availability of water, such as artificial recharge of groundwater. Traditional water conservation practices, like rain water harvesting, including roof-top rainwater harvesting and use of such water through dual plumbing systems need to be promoted in all buildings. Pilot projects will be supported for demonstration effect. Research and development in these areas shall also be supported.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvement in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should broadly include drinking water followed by irrigation, ecology, afforestation/biodiversity/tourism, agro-industries, hydro-power, non-agro-based industries, and navigation and other uses.

Draft Urbanisation Policy, 2009: The Urbanisation Policy, Section 19 outlines 'Preservation of Environment'. Its Subsection 19.6 states that "no damage to natural drainage shall be caused and a distance, as under mentioned, from the highest flood level shall have to be left from the drainage lines." For Rivers, it is 25 metres; for *khuds* /streams, it is 10 metres and for *nallahs*, it is five metres.

The State's New Hydropower Policy, 2006: It has made it mandatory to release minimum environmental flow of 15 percent water immediately down-stream of the diversion structures to address issues concerning riparian rights, drinking water, health, aquatic

life, wild life, fisheries, silt and even to honour sensitive religious issues, like cremation and other religious rites etc. on the river banks. Further, the Government would create an Authority of Hydro-Project Safety, Quality Control and Management of Water Flows and Discharge in due course.

Himachal Pradesh Forest Sector Policy, 2005: The Forest Sector Policy introduced a 'Forest Sector Concept' where it encompasses the entire biophysical and environmental components comprising lands and biological resources (i.e., watersheds, wetlands, wildlife) and includes stakeholders and institutions directly or indirectly dependent on or responsible for the management of these resources for livelihood security and sustenance.

The State level policy on forest development also deals with combating desertification by undertaking various measures, such as, in-situ soil and water conservation and water harvesting. It also emphasises on Watershed Management.

Tourism Policy, 2005: This Policy document aims to provide clear direction for the development of tourism in the State. It seeks to harness the fullest potential of the State for the development of tourism, which, in turn, can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The Government proposes to replicate the Manali model of green fee collection from tourists in other major tourism destinations. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plan will be created and implemented in time bound manner. Water supply and sanitation are part of the Master Plan.

River/Stream Bed Mining Policy Guidelines for the State of Himachal Pradesh, 2004, Notified on 28-2-2004: Under these guidelines, no river/stream bed mining shall be allowed within 75 meters from the periphery of soil conservation works, nursery plantation, check dams, 1/5th of its span or five meters from the bank, whichever is higher, 200 meters up-stream (U/S) and down-stream (D/S) of Water Supply Scheme, 200 meters up stream and 200 to 500 meters down stream of bridges, depending upon site-specific conditions, or within the distance as recommended by the Sub-Divisional Committee, whichever is more.

Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Act, 2005: The State Government has enacted Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act, 2005 (Act No. 31 of 2005) and Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Rules, 2006. These rules grant permits for sinking of well and use of groundwater for domestic and irrigation purposes.

The Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implement the provisions of the Act, may (a) Issue guidelines for the adoption of rain water harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural and urban areas; (d) undertake Information, Education and Communication (IEC) activities, such as workshops, seminars, public discourses, debates, radio and television programmes to promote rain water harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and Government Departments to include in their developmental schemes/plans, the provision of rain water harvesting for

groundwater recharge in the notified areas provided that in urban areas within the notified area, no directions issued under these rules shall be applicable for construction of rain water harvesting structures: (a) in residential or commercial premises having plinth area of less than100 square meters; or (b) in the sinking zones, where construction of rain water harvesting structures would be detrimental to the safety of the building structures in the area.

The Himachal Pradesh Town and Country Planning Act, 1977: This Act makes provision for the planning and development and use of land to make better provision for the preparation of development and sectoral plans with a view to ensure that town planning schemes are made in a proper manner and their execution is made effective; to constitute the Town and Country and Development Authority for proper implementation of town and country development plan; to provide for the development and administration of special areas through the Special Area Development Authority; to make provision for compulsory acquisition of land required for the purpose of the development plans and connected purposes.

This Act mandates the preparation of development plan, regional and sectoral plans and tourist development schemes. The development of these plans mandates (a) requirements and suggestions for development of public utilities, such as water supply, drainage and electricity.

A development plan shall consist of (i) residential, industrial, commercial or agricultural purposes; (ii) open spaces, parks and gardens, green belts, zoological gardens and play-grounds; (iii) lay down the pattern of National and State Highways connecting the planning area with the rest of the region, ring roads, arterial roads and other major roads within the planning area; (iv) project the requirement of the planning area of such amenities and utilities as water, drainage, electricity and suggest their fulfillment; (v) lay down broad-based traffic circulation patterns in a city; (vi) indicate measures for flood control, prevention of air and water pollution, disposal of garbage and general environmental control.

The Himachal Pradesh Municipal Act, 1994: This is an Act to consolidate, amend and replace the law relating to Municipalities in Himachal Pradesh. Under the provisions of Subsection (1) of Section 47, the State Government shall, by notification, endow the Municipalities with such powers and authorities as may be necessary from time to time to enable them to function as institution of Local Self Government with respect to: (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and implementation of schemes, which may be entrusted to them including (1) urban and town planning; (2) planning for economic and social development; (3) water supply for domestic, industrial and commercial purposes; and (4) public health, sanitation conservancy and solid waste management.

The Municipal fund shall be applicable to the payment, in whole or in part, of the charges and expenses incidental to matters within the Municipal area and, with the sanction of the State Government, outside the Municipal area, namely: (a) the construction, maintenance, improvement, cleansing and repair of all public streets, bridges, town-walls, town-gates, embankment, drains, privies, latrines, urinals, tanks and watercourses and the preparation of compost manure; the watering and lighting of such streets or any of them; the supply, storage and preservation of water from pollution for the use of people or animals.

Provisions for Water Supply: (1) The Municipality may, and when the State Government so directs, shall provide the area under the control or any part thereof with a supply of wholesome water sufficient for public and domestic purposes; (2) for the purpose of providing such supply within the Municipality, the Municipality shall cause such tanks, reservoirs, engines, pipes, taps, and other

works, as may be necessary, to be constructed or maintained, whether within or outside the Municipal area, and shall erect sufficient standpipes or other conveniences for gratuitous supply of water to the public; (3) when required by the Health Officer, the Municipality shall arrange for the examination of water supplied for human consumption for the purpose of determining whether the water is wholesome.

Supply of Water for Domestic Purposes: (1) The Municipality may, on application by the owner of any building, arrange for supplying water from the nearest main to the same for domestic purposes in such quantities as it deems reasonable and may, at any time, limit the amount of water to be so supplied whenever it considers it necessary; (2) no additional charge shall be payable in respect of such supply in any Municipal area in which a water tax is levied, but for water supplied in excess of the quantity to which such supply is under Subsection (1) limited, and in other Municipal areas for all water supplied under this Section, payment shall be made at such rate as may be fixed by bye-laws.

Supply of Water for other than Domestic Purposes: (1) The Municipality may supply water for any purpose, other than a domestic purpose, on receiving a written application specifying the purpose for which such supply is required and the quantity likely to be consumed; provided that for building purposes, water supply shall be made for a period of one year, in the first instance, on an application accompanied by a copy of a building plan duly sanctioned by a competent authority and, thereafter, be extended by six months at a time for a period not exceeding the period allowed for the completion of the construction or for three years, whichever is less; provided further that the water supply made for the building purposes, on or before the commencement of this Act, shall continue for a period of three years reckoned from such commencement; (2) for all water supplied under Subsection(1) payment shall be made at a rate not less than the rate prescribed under Subsection (2) of Section 101; (3) the municipality may withdraw such supply at any time if it should appear necessary to do so in order to maintain sufficient supply of water for domestic purposes.

Procedure for Water Connections: (1) Where an application under Section 101 or 102 has been received, all necessary communication pipes and fittings shall be supplied by the Municipality and the work of laying and applying such communication pipes and fittings shall be executed by the Municipal agency under Municipality orders; but the cost of making any such connection, and of all communication pipes and fittings so supplied, and of all works so executed, shall be paid by the owner or the person making such application. The Municipality may either provide a meter and charge rent for the same or may require the owner or applicant to provide a meter of such size, material and description as it shall approve; (2) notwithstanding anything in Subsection (1), the Municipality may require any owner or person applying for a supply of water to provide all communication pipes and fittings and to carry out, at his own cost and under its supervision and inspection, all the work of laying and applying such communication pipes and fittings.

Obligation of Owner or Occupier to Give Notice for Wastage of Water: Any owner or occupier of any building or land, in or on which water supplied under this Act is misused from negligence or other circumstances under his control, or used without permission in excess of the quantity fixed under Sections 101 or 102, or in which the pipes, mains, or other works are out of repair to such an extent as to cause wastage of water, shall if he has knowledge thereof, be bound to give notice of the same to such officer as the municipality may appoint on its behalf.

Cutting off Water Supply to Premises: If any person, whose premises are supplied with water, neglects to pay the water-tax, or any sum payable under Sections 101 or 102 when due,

or to give notice as provided in the last proceeding Section or willfully or negligently misuses or causes wastage of water, the municipality may, after due notice, cut off the supply of water from the said premises.

Power to Require Buildings Owners to Provide Storage Reservoirs for Rain Water on their Premises: (I) Whenever it appears to the Municipality or to the State Government desirable to require the owners of buildings or lands, situated within the limits of the whole or any part of a municipal area to make suitable provisions for the storage and conservation of rain-water for use in flushing drains and for any purposes other than for the purposes of being used as drinking water, such Municipality, if so required by the State Government, shall, and, in any other case, may, with the previous sanction of the State Government, by public notice, direct accordingly; (2) every notice, given under Subsection (I) shall state (a) the extent of the local area within the limits or which owners of buildings and lands are to make suitable provision for the storage of rain-water; (b) the manner in which the cubic capacity of the store accommodation to be provided by such owners is to be fixed, that is, whether the extent of such capacity is to be regulated by reference to the land area, the size of the building, the number of occupants, or the estimated rental value thereof or by any two or more of these methods; (c) the design, materials, situation and construction of the reservoirs or other storage accommodation to be provided; (d) the mode of collecting, storing, preserving from pollution and in a pure state and using the rain water to be collected and stored; and (e) the time within which the requirements of the notice are to be complied with.

Repair of Reservoirs: The Municipality may, by notice, require the owner or occupier of any building or land in respect of which a reservoir for the storage and conservation of rain water has been provided under Section 107 to repair, alter or put in good condition the said reservoir.

The Municipality may set apart suitable places for the purpose of bathing and may specify the times at which and sex of the persons by whom, such places may be used and may also set apart, suitable places for washing animals or clothes, or for any other purpose connected with the health, cleanliness or comfort of the inhabitants; and may, by public notice, prohibit bathing or washing animals or clothes in any public place not so set apart, or at times or by persons other than those specified, and any other act by which water in public places may be rendered foul or unfit for use, and may charge fees for the use of such places by any specified class or classes of persons or by the public generally. The Municipality may fix, by notice, places at which articles of clothing, bedding or other articles, which have been exposed to infection, shall be washed, and, no person shall wash any such article at any place not so fixed.

Provisions of Drains and Privies: (1) The Municipality may, by notice, require the owner of any building or land to provide, move or remove any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse or provide any additional drains, privies, latrines, urinals, cesspools or other receptacles as aforesaid, which should, in its opinion, be provided for the building or land in such manner and of such pattern as the Municipality may direct; (2) the Municipality may, by notice, require any person employing more than twenty workmen or labourers to provide such latrines and urinals as it may think fit and to cause the same to be kept in proper order and to be cleaned daily; (3) the Municipality may, by notice, require the owner or occupier of any building or land to have any privy, latrine or urinal provided for the same shut out by a sufficient roof and wall fence from the view of persons passing by or dwelling in the neighbourhood, or to remove or alter, as the Municipality may direct, any door or trapdoor of a privy, latrine or urinal opening on to any street or drain; and (4) the Municipality may, and when required by the State Government,

shall provide latrines and urinals for the use of public.

Repair and Closing of Drains and Privies: (1) The Municipality may, by notice, require the owner or occupier of any building or land to repair, alter, or put in good order any drain, privy, latrine, urinal, cesspool or receptacle for any filth or refuse, or to close any drain, privy, latrine, urinal or cesspool belonging thereto; (2) the Municipality may, by notice, require any person, who has constructed any new drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse without its permission in writing or contrary to its directions or regulations or the provisions of this Act, or who has constructed, rebuilt or opened any drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse, which it has ordered to be demolished or stopped or not to be made, to demolish the drain, privy, latrine, urinal, cesspool, receptacle, or to make such alteration therein, as it may think fit.

Unauthorised Building over Drains: The Municipality may, by notice, require any person, who, without its permission in writing, has newly erected or rebuilt any building over any sewer, drain, culvert, water course or water pipe vested in the Municipality, to pull down or otherwise deal with the same as it may think fit.

Removal of Latrines etc. near any Source of Water Supply: (1) The Municipality may, by notice, require any owner or occupier on whose land any drain, privy, urinal, cesspool or other receptacle for filth or refuse for the time being exists within fifteen metres of any spring, well, tank, reservoir or other source from which water is or may be derived for public use, to remove or close the same within one week from the serving of such notice; (2) whoever, without the permission of the Municipality makes or keeps, for a longer time than one week after notice under this Section, any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse, within fifty feet of any spring, well, tank, reservoir or any other source from which water is or may be derived for public use, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees and, when a notice has been issued, with a further fine of ten rupees for each day during which the offence is continued after the lapse of the period allowed for removal.

Discharging Sewerage: Whoever, without the permission of the Municipality, causes or knowingly or negligently allows the contents of any sink, sewer, or cesspool or any other offensive matter to flow, drain or be put upon any street or public place, or into any irrigation channel or any sewer or drain not set apart for the purpose, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees.

Making or Altering Drains without Authority: Whoever, without the permission of the Municipality makes or causes to be made,oraltersorcausestobealtered,any drain leading into any of the sewer or drains vested in the Municipality, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees.

Power to Require Removal of Nuisance Arising from Tanks and the Lake: The Municipality may, by notice, require the owner or occupier of any land or building to cleanse, repair, cover, fill up or drain off any private well, tank, reservoir, pool, depression or excavation therein, which may appear to the Municipality to be injurious to health or offensive to the neighborhood; provided that if for the purposes of effecting any drainage under this Section, it should be necessary to acquire any land not belonging to the same owner or to pay compensation to any person, the Municipality shall provide such land or pay such compensation.

Connection with Main not to be Made without Permission of Municipality: (1) No person shall, without the permission of the Municipality, at any time, make or cause to be made, any connection or communication with any cable, wire, pipe ferrule, drain, sewer or channel constructed or maintained by or vested in the Municipality, for any purpose

whatsoever; (2) any person acting in contravention of the term of Subsection (1) shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees.

Sewerage Connection: (1) The Municipality may, at any time, establish any connection or communication from any water-main, drain or sewer to any premises or may, by notice, require the owner of any such premises to establish any such connection or communication in such manner and within such times as the Municipality, by notice on that behalf, may prescribe at the cost of such owner or occupier; (2) notwithstanding anything contained in Subsection (1) it shall be the duty of the house owner or occupant of any premises to connect his latrines, urinals and septic tank, as the case may be, with sewerage line where sewerage system has been provided by the Municipality, at his own expenses, by getting sewerage connection from the Municipality and if he fails to do so, he shall be punishable with fine, which may extend to two thousand rupees, but shall not be less than five hundred rupees, in addition to other charges for such connection, which in case of continuous default, will result in disconnection of essential services viz. water, electricity etc.; provided that where sewerage line is passing through other person's land, the sewerage connection shall be connected to the sewerage line through the boundary lines of such land or where the building has been constructed, the line shall be laid through the setbacks of such building, whichever is feasible.

Troughs and Pipes for Rain Water: *(*1) The municipality may, by notice, require the owner of any building or land in any street to put up and keep in good condition proper troughs and pipes for receiving and carrying water and sullage from the building or land and for discharging the same, so as not to cause inconvenience to persons passing along the street; (2) for the purpose of efficiently draining any building or land the Municipality may, by notice, in writing, (a) require any courtyard, alley or passage between two or more buildings to be paved by the owner or part-owner of such buildings with such materials and in such manner as may be approved by the Municipality; and (b) require such paving to be kept in proper repair.

Prohibition by Municipality of Use of Unwholesome Water: Should the Municipality, on the report of the Health Officer, consider that the water in any well, tank or other place is likely, if used for drinking, to endanger or cause the spread of any dangerous disease, it may *(a)* by public notice, prohibit the removal or use of such water for drinking; *(b)* by notice, require the owner or person having control of such well, tank or place to take such steps as may be specified in the notice to prevent the public from having access to or using such water; or *(c)* take such steps, as it may, on the advice of the Health Officer, which are considered expedient to prevent the danger or spread of any such disease.

The Himachal Pradesh Municipal Business Bye-Laws, 2006: The General Standing Committee shall perform functions relating to: (a) establishment matters; (b) communication of general nature; (c) building regulations etc.; (d) urban housing projects etc.; (e) relief against natural calamities; (f) water supply for the town; (g) to enquire and report on all matters relating to Municipal works, maintenance and verification of Municipal and nazul properties, roads and buildings under the control of the Municipality. It shall also supervise all Municipal works connected with buildings, road, drains etc.

The Municipal Medical Officer of Health shall be in charge of the Sanitation, Public Health and Health Departments of a Municipality. He shall supervise the sanitary conditions of all buildings and lands, burial and burning places, markets, slaughter houses, streets, drains, sewerages, latrines, urinals, filth receptacles, cesspools, flushing appliances, farms, filth depots, dairies, milk shops, cow sheds, stables, meat shops and all shops dealing in edibles, bakeries, aerated water factories, wells and *dhobi*

ghats etc. He shall also check the houses unfit for human habitation, offensive trades, foods and drinks, plants and stores.

The Municipal Engineer shall be in charge of the Engineering and Building Department. He shall be responsible for house connections of filtered water, supply system, road lighting, water meters, municipal lands and properties, machinery, plants and stores and shall maintain registers and stock books laid down in the Municipal Accounts Code and the Municipal Works Rules.

Notification No. IPH-B(C) 10-1/2004, Dated: Shimla-1712002, 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), different charges applicable are given below in Table 2.

Table 2: Rural Water Supply Sector

	Domestic rate	Commercial rate
Connection charges	Rs. 100/-	Rs. 200/-
Consumption charges	Rs. 10/- per connection per Month	Rs. 8 per KL subject to minimum of Rs. 100/- per month

This tariff will increase by 10 percent on the 1st of April every year.

Notification No. IPH-B(F)2-2/2004, Dated: Shimla-1712002, 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), the following rates are applicable for Water Supply by the Irrigation & Public Health Department in all Nagar *Panchayats* and Municipal Committee areas except Solan, Palampur and Municipal Corporation, Shimla w.e.f. 1.6.2005.

	Domestic rate	Commercial rate
Connection charges	Rs. 300/-	Rs. 500/-
Consumption charges	Rs. 4/- per KL	Rs. 8 per KL

The tariff for water consumption shall be increased by 10 percent with effect from 1st April every year.

Notification No. IPH-B(F)5-4/2004, Dated: Shimla-1712002, 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), the following rates are applicable for bulk supply of drinking water by Irrigation and Public Health Department in Himachal Pradesh as under w.e.f. 1.6.2005.

Table 3: Charges for Bulk Supply by IPH to Municipal Committees

	Rate
Bulk supply for Shimla Municipal Corporation.	Rs. 8/- per KL
Bulk supply for Solan Municipal Committee.	Rs. 8/- per KL
Bulk supply for Palampur Municipal Committee.	Rs. 4/- Per KL

The rates will increase by 10 percent on the 1st of April every year.

Notification No. IPH-B(F)10-3/2004, Dated: Shimla-2, 23.3.3007: A penal levy for non-metering of domestic drinking water connection @ of Rs. 60 per connection per month will be charged within two months from the issuance of this Notification to ensure that meters are installed. This rate will be doubled every four months in the event of continued non-metering.

Commercial urban and rural consumers of drinking water will install the meters within one month from the date of this notification. Till then, the average consumption being charged at present will continue. If meters are not installed within one month, the average rate of consumption charges will be doubled. To ensure the installation of meters, this rate will double every two months, thereafter.

The Himachal Pradesh Housing and Urban Development Authority Act, 2004: This Act seeks to re-enact the law to provide for the creation of a Development Authority to plan and develop land and create infrastructure to meet with the housing needs of different income groups and to provide for development schemes for mobilising public and private resources for the promotion of housing colonies and related infrastructure and to provide for the creation of appropriate authority and mechanisms for planned development of housing colonies.

A development scheme may provide for (a) drainage, water-supply and lighting of the area included in the scheme; and (b) sanitary arrangements required for the area comprised in the scheme including the conservation and prevention of any injury or contamination to rivers or other sources and means of water supply.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This is an Act to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act describes the framing and finalising of schemes for execution. The housing and development schemes may be one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform functions, such as (a) mobilising voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identifying beneficiaries for the implementation of developmental schemes pertaining to the village; and (c) rendering assistance in the implementation of developmental schemes pertaining to the village, such as:

- Approving plans, programmes and budget, prepared by the *Gram Panchayat* for economic development and social justice.
- Authorising after being satisfied, issuance of utilisation certificate of funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for the maintenance and repair (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing other acts, which are likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation at the village level by the *Gram Panchayat*; and (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Management of Minor Water Bodies in the Scheduled Area: Planning and management of minor water bodies in the scheduled areas shall be entrusted to *Gram Panchayats*, *Panchayat Samitis* or the *Zila Parishads*, as the case may be, in such manner as may be prescribed.

Chapter-XII of this Act describes the preparation of development plans and the role

of the District Planning Committee. Preparation of development plans include steps, such as (1) every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective areas and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute a District Planning Committee in every district to consolidate the plans prepared by the *Zila Parishad*, *Panchayat Samitis*, *Gram Panchayats* and Municipalities in the district and to prepare a draft development plan for the district as a whole.

Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This is an Act to prevent throwing or depositing non-biodegradable garbage in public drains, roads and places open to public view and to regulate the use of non-biodegradable material in the State. The Act prohibits throwing of degradable garbage in public drains and sewage and has provision for placement of receptacles and places for depositing non-biodegradable garbage. It defines the duty of owners and occupiers to collect and deposit non-biodegradable garbage etc. and the power of local authority for removal of non-biodegradable garbage. It stresses on studies, research and support programmes.

State's Sector Reforms: Reforms in Rural Drinking Water Supply sector were adopted in 1999 in the country and Pilot Projects were taken up in selected 67 Districts of 26 States. The basic concepts of reforms include community participation in the planning, implementation, operation and maintenance of schemes of its choice.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This Act defines the functions of Tourist Development Board under Section 8 of Chapter II. Section 17, Chapter III of the Act describes the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the function of the Council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spot, environmental upgradation etc; assist the local body in maintaining sanitation and infrastructure facility at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities; prepare a Tourism Master Plan for its area; and all tourism units and establishment shall conform to the Master Plan.

Other Sub-programmes / Strategies

Central Rural Sanitation Programme (Total Sanitation Campaign): The concept of sanitation was earlier limited to disposal of human excreta by cesspools, open ditches, pit latrines, bucket system etc. Today, it connotes a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, personal, domestic as well as environmental hygiene. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal.

The 'Total Sanitation Campaign (TSC)' emphasises more on Information, Education and Communication (IEC), Human Resource Development, and Capacity Development activities to increase awareness among the rural people and generation of demand for sanitary facilities.

The main objectives of the TSC are to: bring about an improvement in the general quality of life in the rural areas; accelerate sanitation

coverage in rural areas; generate felt demand for sanitation facilities through awareness creation and health education; cover schools/Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students; encourage cost effective and appropriate technologies in sanitation; eliminate open defecation to minimise risk of contamination of drinking water sources and food; convert dry latrines to pour/flush latrines, and eliminate manual scavenging practice, wherever in existence in rural areas.

The implementation of TSC is proposed in a project mode. A project proposal emanating from a district is scrutinised by the State Government and transmitted to the Government of India (Department of Drinking Water Supply, Ministry of Rural Development). TSC is implemented in phases with start-up activities. Funds are made available for preliminary IEC work. The physical implementation gets oriented towards satisfying the felt-needs, wherein individual households choose from a menu of options for their household latrines.

Jawahar Lal Nehru Urban Renewal Mission (JNNURM): JNNRUM was launched in the month of December, 2005 for developing basic urban infrastructure and urban slum development in 63 cities of India.

The objectives of JNNURM are to: assist cities achieve focused attention to integrated development of infrastructure services and meet the deficiencies in infrastructure projects; and secure effective long term sustainability of projects by establishing linkages between asset creation and management through reforms, so that the infrastructural services created in the cities are not only maintained efficiently but also become self-sustaining over time.

The duration of mission is seven years starting from the year 2005-06 and on its completion, it is expected that a city would have achieved, modern and transparent budgeting, accounting, financial management systems, designed and adopted for all urban service and governance functions; city wide framework for planning and governance will be established and become operational; all urban residents will be able to obtain access to a basic level of urban services; financially self sustaining agencies for urban governance and service delivery will be established through reforms in major revenue instruments; local services and governance will be conducted in a manner that is transparent and accountable to citizens; and E-governance applications will be introduced in core functions of ULB/parastatal resulting in reduced cost and time of service delivery; the Mission encourages the leveraging of funds available under JNNURM assistance by enhancing resource availability with ULBs/parastatal, commercial viability and bankability of the projects and by incorporating Private Sector efficiencies in development, financing, implementation and management of projects.

Urban Renewal includes redevelopment of inner (old) city areas (this would include items like widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner-city) areas to conforming (outer-city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal system etc. Land acquisition cost will not be financed under this component of the programme. It also includes water supply including setting up de-salination plants, where necessary; sewerage and solid waste management; construction and improvement of drains/storm water drains; urban transport; laying/improvement/widening of arterial/sub-arterial roads and bridges to remove transport bottlenecks; laying of ring roads and by-passes around metro and mega cities, provided certain cost recovery measures like toll charges are built in; construction and development of bus and truck terminals; environmental improvement and city beautification schemes; construction of working women hostels, marriage hall, old age and destitute children's

homes, night shelters with community toilets etc.

For special category States like Himachal Pradesh, the pattern of funding is 80 percent by Government of India, 10 percent by State Government and 10 percent by local Municipality.

Under JNNURM scheme, Shimla town has been covered for undertaking different activities. These activities include setting up of Solid Waste Management Improvement of Shimla city; rehabilitation of water supply distribution system for Shimla city; and rejuvenation of sewerage network in missing lines and left out areas.

Rajiv Gandhi Urban Renewal Facility (RGURF): In order to strengthen the urban infrastructure and clean environment in urban areas of the State, this scheme was launched in 2006-07 for infrastructure and sanitation improvement in all urban areas of the State other than Shimla. The main objectives of the Scheme are infrastructure and sanitation improvement in all urban areas of the State.

The main components of the scheme are: management of urban solid waste; parking lots within towns for cars etc. and on the fringe of the town for trucks. The truck parking facilities shall also integrate the workshops, *dhabas* and other eateries, common civic amenities etc. The land for such parking lots shall have to be provided by the local bodies and the State Government shall not make any provision for cost of land; setting up of new public amenities by way of community toilets within the existing towns, especially in the proximity of bus stands, hospitals, main shopping areas etc. The new community toilets shall be on a lease/contract basis with M/s Sulabh International that already has its presence in the State; development of parks within the existing towns; and the Urban Local Bodies shall get detailed project report prepared for each proposal. The cost of DPRs could also be an integral part of the overall project cost and its funding.

The funds will be provided to Municipal Council/*Nagar Panchayat* on 'first come first serve basis; as 95 percent Government Grant of total DPR cost and remaining five percent is to be borne by the Municipality out of its own resources under Rajiv Gandhi Urban Renewal Facility (RGURF) for infrastructure and sanitation improvement in urban areas. During the financial year 2010-11, there is a budgetary provision of Rs.671.00 lakhs under this scheme for infrastructure and sanitation improvement in urban areas.

Environmental Improvement of Urban Slums (E.I.U.S): Environmental Improvement of Urban Slums (E.I.U.S.I) and National Slum Development Programme (NSDP) were launched in Himachal Pradesh during 1982-83 and were being implemented by TCP Department till 1998-99. The scheme had been transferred to the Directorate of Urban Development during the year 1999-2000 for further implementation. This programme falls under Special Component Plan (SCP) on which 50 percent of the budget is being utilised every year.

The aims and objectives of the scheme are to improve the environmental condition of 2.50 lakhs slum dwellers living in 374 slum pockets in 49 Urban Local Bodies of the State. This is being carried out by way of providing community facilities, such as path, drain, *raen baseras* (night shelters), toilets, street lights, parks, roads and storm water drains (gutters) etc. to benefit the slum population of Himachal Pradesh.

The State scheme shall first get sanctioned by a State level project committee which shall be set up for this purpose by the State Government concerned and shall have one representative from the Department of UEPA, which is the nodal Department for this scheme.

At the district level, the Deputy Commissioner of the district monitors quarterly progress under this programme at the State level, the State Government monitors the progress under this programme and at the National level, the

Department of Urban Employment and Poverty Elevation of Government of India monitors the progress under this programme.

The funds for this scheme are being received through State Plan Budget under head 2217-Urban Development. The Social Justice and Empowerment Department has been declared as the Administrative Department for the implementation of this scheme under the Scheduled Caste Sub-Plan of the State Budget.

During the year 2009-10, Rs. 244.00 lakhs were released to the ULBs under Environment Improvement of Urban Slum (EIUS) scheme to benefit 3300 BPL families by providing basic amenities and infrastructure viz. community taps, hand pumps, street lights, community bathrooms and latrines, roads, pavements, sewerage and storm water drainage, *Raen Baseras* etc. in slum areas. A budget provision of Rs. 294.00 lakhs to benefit 3600 slum families in the financial year 2010-11 was under this scheme.

Integrated Housing & Slum Development Programme (IHDSP): This scheme was launched on 3rd December, 2005. The basic objective of the scheme is to strive for slum-less cities by adopting holistic slum development with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.

The components for assistance under the scheme will include all slum improvement / upgradation / relocation projects including upgradation/new construction of houses and infrastructural facilities; provision of shelter including upgradation and construction of new houses; provision of community toilets; water supply and sewerage. The cost of land for such projects will not be provided under the programme and has to be borne by the State Government. In case the project is to be undertaken on private land, which is to be acquired by the State, cost of land may also be part of project costing only in the case of North Eastern States and the hilly States of Himachal Pradesh, Uttarakhand and Jammu and Kashmir; for the provision of physical amenities, like water supply, storm water drains, community bath, widening and paving of existing lanes, sewers, community latrines, street lights etc.

The scheme will apply to all towns and cities excepting cities/towns covered under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). Allocation of funds among States will be on the basis of the ratio of State's urban slum population to total urban slum population in the country. The funds will be provided only to those towns and cities where election to the local bodies have been held and elected bodies are in position. The sharing pattern for the hilly State like Himachal Pradesh is 80 percent by the Central Government, 10 percent by the State Government and the remaining 10 percent by the financial institutions.

Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT): In December, 2005, the Government of India launched a new scheme, namely Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSMT) by subsuming the existing schemes of IDSMT (Integrated Development of Small and Medium Towns) and AUWSP (Accelerated Urban Water Supply Programme). Admissible components include urban renewal i.e. redevelopment of inner (old) city areas. This includes widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner city) to conforming (outer city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal systems etc.; water supply (including de-salination plants) and sanitation; sewerage and solid waste management; construction and improvement of drains/storm water drains; parking lots/spaces on Public-Private Partnership basis and the preservation of water bodies. The project is to be prepared by the ULB with 80 percent Central share, 10 percent State share and 10 percent ULBs share.

Government of Himachal Pradesh has declared HIMUDA as the nodal agency for the preparation and execution of the UIDSSMT Scheme.

Nodal agency will be Responsible for: Inviting project proposals from ULBs / Parastatal / implementing agencies; techno-economic appraisal of the projects either through in-house expertise or by outside agencies through outsourcing; management of funds received from Central and State Governments; disbursement of the funds; furnishing of utilisation certificates within 12 months of the closure of the financial year and quarterly physical and financial progress reports to the Ministry of Urban Development; maintenance of audited accounts of funds released to the ULBs and implementing agencies; and monitoring of implementation of reforms and infrastructure projects.
It is mandatory that before the project is submitted for approval to the Government of India, the State Government and ULBs will have to accept implementation of agenda of reforms. The proposed reforms shall broadly fall in two categories: a) mandatory reforms by the State and the ULBs; and b) optional reforms by the State and the ULB.

Urban Water Supply: The proposed outlay for eleventh five year plan 2007-12 was Rs. 54717.00 lakhs, out of which Rs. 29760.00 lakhs was proposed for major works. For augmentation of water supply, 15 towns - wereproposed for the plan period.

Rural Water Supply: As on 1st April, 2007, only 1407 partially covered habitations were left to be covered with safe drinking water facilities in the State. The proposed outlay for Eleventh Five Year Plan (2007-12) had been kept at Rs. 72616.00 lakhs with a target to cover 3000 habitations under State sector. Besides, there was a target of 1500 hand pump installations during 11th Five Year Plan.

Hand Pumps Installation Programme: Drinking water facilities are also being provided through the important programme of hand pumps installation at location of priority in drought prone/acute water scarcity areas. However, the programme is generally supplementing the existing piped water supply schemes in drought prone/water scarcity areas due to limitation that the hand pumps are being installed along road side locations.

There are district level programmes, like *Vikas Mein Jan Sahayog* (People's contribution towards development) in which communities or individuals contribute about 25 percent of the amount for infrastructure development and the rest is contributed by the Government.

The Government has made it mandatory to construct rain water harvesting structures in all the buildings in the State. The Government is implementing various watershed schemes through its Development Departments with the involvement of the PRI and community.

Department of Rural Development implements watershed and other water supply programmes, develops the micro watersheds and has bearing on development and conservation of water resources.

Drought Prone Area Programme (DPAP): This programme is basically an area development programme and aims at integrated development of natural resources, like land, water, vegetation etc. by taking up watershed development projects. The programme is being implemented in 10 blocks of the State. Upto the year 1998-99, the programme was being funded by the Central and State Governments on 50:50 sharing basis, but from 1-4-1999, the Government of India has changed the funding pattern from 50:50 to 75:25. Under this programme, 318 micro watersheds have been taken up for development in district Bilaspur, Solan and Una for a period of five years. During the year 2005-2006, 40 new micro watersheds have been sanctioned by the Government of India under the programme.

Desert Development Programme (DDP): Under DDP, 420 micro watersheds have been

taken up for development in the district of Lahaul and Spiti and Pooh block of district Kinnaur. The Government of India has sanctioned 38 new micro watershed projects under this programme during the current financial year. (23 micro watersheds for Lahual and Spiti and 15 micro watersheds for Kinnaur district).

Integrated Wastelands Development Programme (IWDP): Integrated Wastelands Development Programme is being implemented in all the districts of the State except Bilaspur, Una and Lahaul and Spiti. Prior to 1.4.2000, the watershed projects under this programme were being funded 100 percent by the Central Government. The projects sanctioned after 1.4.2000 are being funded on Rs. 5500/- per ha by the Government of India and Rs. 500/- per ha by the State Government. During the year 2003-2004, eight new IWDP projects have been sanctioned and an amount of Rs. 1446.53 lakhs has been released to the districts for ongoing as well as newly sanctioned projects. During the year 2004-05 the Government of India has sanctioned two new projects with a total project outlay of Rs. 900.00 lakhs for treatment of 15,000 ha of land.

National Rural Employment Guarantee Scheme: The National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective w.e.f. 2 nd February 2006. The focus of the scheme is on the following works in their order of priority: water conservation and water harvesting works; drought proofing works (including afforestation and tree plantation); irrigation canals including micro and minor irrigation works; provision of irrigation facilities, horticulture, plantation and land development facilities on lands owned by households belonging to the Scheduled Castes and Scheduled Tribes or Below Poverty Line (BPL) families or the beneficiaries of land reforms or the beneficiaries under the Indira Awas Yojana of the Government of India; renovation of traditional water bodies including desilting of tanks; land developments works; flood control and protection works including drainage in water logged areas; rural connectivity to provide all-weather access. Till September 2010, about 422 works have been completed while 12310 works are in progress on water conservation and water harvesting structures; about 234 works have been completed and 3842 are in progress for renovation of traditional water bodies; 16 works have been completed and 751 are in progress for drought proofing; 218 works have been completed and 9650 works are in progress in the area of irrigation canals; 70 works have been completed and 118 works are in progress for providing irrigation facilities to SC/ST/IAY/LY; and 367 works have been completed while 6840 works are in progress for land development.

Establishment of *Parivar Kalyan Salahkar Samiti* (PARIKAS): Himachal Pradesh Government has set up health and family welfare advisory committees known as *Parivar Kalyan Salahkar Samiti* (PARIKAS) at the *Panchayat*, block and district levels for the involvement of the PRIs. The functions of the *Panchayat* PARIKAS include supervision and monitoring; implementation of national health programmes; ensuring cleanliness of the villages; checking pollution of water, air and noise; making people aware of dog and snake bites and their first aid treatment; and cleaning and using bleaching powder etc.

National Lake Conservation Plan (NLCP), 2001: Recognising the importance of lakes, the Ministry of Environment and Forests, Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The scheme was approved by the Government of India during IX Plan (June 2001) for 100 percent Central grant. Funding pattern under NLCP has since been changed w.e.f. February, 2002 from 100 percent Central funding to

70:30 cost sharing between the Central and the concerned State Government.

The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country degraded due to waste water discharge into the lakes and other unique freshwater ecosystems, through an integrated ecosystem approach. Unique fresh water ecosystems cover lakes that are unique entities of incomparable values and need to be preserved and conserved, e.g., high altitude lakes, Lonar lake in Maharashtra etc.

Health Vision, 2008: The Health Vision 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for attainment of targets. The primary goal of Vision 2008 is to achieve the status – Health for All.

Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen the existing system to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.

Sewerage development plan is being administered by the Urban Development Department instead of Irrigation and Public Health (I&PH) Department w.e.f. 1.4.2008. Hence, the previous programme under this head and activities prepared for the annual plan 2008-09 are for 56 towns in Himachal Pradesh, out of which 49 towns are under I&PH Department. Six towns (Yol, Bakloh, Kasauli, Sabhatu, Dagshai and Dalhousie Cantonment) are under Cantonment Boards and Parwanoo is under the Housing Board. Sewerage schemes for 13 towns namely, Sh. Naina Deviji, Chamba, Mandi, Bilaspur, Palampur, Rohroo, Shimla, Manali, Ghumarwin, Jawalamukhi, Arki, Jogindernagar and Rampur have been completed. Two rural/tribal schemes, Sarahan and Reckong Peo, respectively, have been completed up to 31st March, 2007. These schemes will assist in the prevention of water bodies' pollution.

Rural Tourism Infrastructure Development Scheme: Under this Scheme, thrust will be to promote village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions. Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be on tapping the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/Departments of the Government of India.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria: (a) the project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open and competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the empowered committee may relax this eligibility criterion; (b) International Convention Centres and other tourism infrastructure projects, provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total project cost. Viability Gap Funding under this scheme will

normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 crores (Rs. One Hundred Crores) for each project may be sanctioned by the empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 crores (Rs. Two Hundred Crores) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 crores may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

2.2 Sewage

The policies and laws applicable and/or related to the development of the State's sewage sector, along with a brief description of their relevance, are listed below. Detailed explanations can be acquired from the websites of relevant Departments, line Ministries, like Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Urban Development (www.urbanindia.nic.in), and Department of Urban Development, Himachal Pradesh (www.hpurbandevelopment.nic.in).

National Level Policies / Regulations

The National Water Policy, 2002: National level policy addresses major water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. This Policy also states about the use of water, water conservation and quantification of water pollution.

Section 1.2 states that rivers and underground aquifers often cut across State boundaries. Water,asaresource,isoneandindivisible.

Therefore, rainfall, river waters, surface ponds and lakes and groundwater are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of project implementation.

Section 14.5 states that necessary legislation is to be made for the preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, such as assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and reuse; better water management practices and improvements in operational technology; economical designs for water resource projects, sedimentation of reservoirs, prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact and regional equity etc.

National Action Plan on Climate Change (NAPCC), 2008: The National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

'National Water Mission' is part of NAPCC and identifies the strategies and methodologies in respect of (a) Assessment of Climate Change Impact; (b) Changes in Policy, Practices and Institutional Framework; (c) Measures for Mitigation; as well as (d) Measures for Adaptations. Appropriate monitoring and

evaluation mechanisms have also been proposed.

"National Water Mission" will be mounted to ensure integrated water resource management helping to conserve water, minimise wastage and ensure more equitable distribution both across and within States. The Mission will take into account the provisions of the National Water Policy and develop a framework to optimise water use by increasing water use efficiency by 20 percent through regulatory mechanisms with differential entitlements and pricing. It will seek to ensure that a considerable share of the water needs of urban areas are met through recycling of waste water; and the water requirements of coastal cities with inadequate alternative sources of water are met through adoption of new and appropriate technologies such as low temperature desalination technologies that enable the use of ocean water.

The National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. This will include enhanced storage both above and below ground, rainwater harvesting, coupled with equitable and efficient management structures.
The mission will seek to develop new regulatory structures, combined with appropriate entitlements and pricing. It will seek to optimise the efficiency of existing irrigation systems, including rehabilitation of systems that have been run down and also expand irrigation, where feasible, with a special effort to increase storage capacity. Incentive structures will be designed to promote water, neutral of water positive technologies, recharging of underground water sources and adoption of large scale irrigation programmes, which rely on sprinklers, drip irrigation and ridge and furrow irrigation.

The National Environment Policy (NEP), 2006: The policy recognises the ecological services rendered by water bodies, like lakes and wetlands. The NEP states that wetlands including lakes are under threat from drainage and conversion for agriculture and human settlements besides pollution. The reduction in economic value of their environmental services due to pollution, as well as the health costs of the pollution itself, are not taken into account while using them as a waste dump.

The NEP recommends developing an action plan for these water bodies, which importantly includes formulation of conservation and prudent use strategies, integration of wetland and lake conservation into sectoral development plans for poverty alleviation and livelihood improvement and formulation of eco-tourism strategies through Multi-Stakeholders Partnership (MSP).

National Urban Sanitation Policy: The National Urban Sanitation Policy urges States to come up with their own detailed State-level urban sanitation strategies and city sanitation plans. It moots the idea of totally sanitised cities and the setting up of a multi-stakeholder city sanitation task force to achieve it. Environmental considerations, public health implications and reaching the unserved and urban poor are given significant emphasis in the Policy.

The vision for urban sanitation in India- as per the National Urban Sanitation Policy is: All Indian cities and towns become totally sanitised, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women. As per issues highlighted in National Urban Sanitation Policy, the following key sanitation policy issues which must be addressed are:

- **Poor Awareness**: Sanitation has been accorded low priority and there is poor awareness about its inherent linkages with public health.
- **Social and Occupational Aspects of Sanitation**: Despite appropriate legal framework, progress towards the elimination of manual scavenging has

shown limited success. Little or no attention has been paid towards the occupational hazards faced by sanitation workers involved in manual scavenging.

- **Fragmented Institutional Roles and Responsibilities**: There are considerable gaps and overlaps in institutional roles and responsibilities at the National, State, and city levels.
- **Lack of an integrated city-wide approach:** Sanitation investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal.

National Health Policy, 2002: The main objective of this national policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralized public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions.

The policy hoped that the independently stated policies and programmes of the environment related sectors are smoothly interfaced with the policies and the programmes of the health sector, in order to reduce the health risk to the citizens and the consequential disease burden.

This policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognizes the significant contributions made by NGOs and other institutions of the Civil Society in making available health services to the community. It also emphasizes the need to simplify procedures for Government – Civil Society interface in order to enhance the involvement of Civil Society in public health programmes.

National Rural Health Mission (2005-12): The National Rural Health Mission (NRHM) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 States including Himachal Pradesh, which have weak public health indicators and/or weak infrastructure. It has as its key components, a village health plan prepared through a local team headed by the Health and Sanitation Committee of the *Panchayat*; and integration of vertical Health and Family Welfare Programmes, and funds for optimal utilization of funds and infrastructure and strengthening delivery of primary healthcare. It aims at effective integration of health concerns with determinants of health, like sanitation and hygiene, nutrition, and safe drinking water through a district plan for health. The major goals of NRHM include reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR), and universal access to public health services such as water, sanitation and hygiene.

The Plan of Action of this Mission has ten components. These components include district health plan, converging sanitation and hygiene, Public-Private Partnership for public health goals. The mission envisages the following roles for Panchayat Raj Institutions: The Village Health Committee of the *Panchayat* would prepare the Village Health Plan (VHP) and promote inter-sectoral integration. It would also ensure the provision of training to Panchayat Raj Institutions members.

Environment (Protection) Act, 1986: This is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it, to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991 has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve the environment, which includes water, air and land and the inter relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844(E), [19/11/1986]. The power conferred by the Environment Protection Act are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution and for maintaining or restoring of wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention & Control of Pollution) Act, 1974, as amended 1988, deals comprehensively with water issues. This empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of streams (includes inland water whether natural and artificial) or well for disposal of polluting matter etc.

This Act provides for the Prevention and Control of Water Pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act deals with the Prevention and Control of Water Pollution. It contains information on the power of the State Government to restrict the application of the Act to certain areas; power to obtain information; power to take sample of effluents and procedure to be followed; submit reports on the result of analysis on samples taken under Section 21; power of entry and inspection; prohibition on the use of stream or well for disposal of polluting matter etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by State Board; appeals; revision; power of the State Board to carry out certain works; furnishing of information to State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Water (Prevention and Control of Pollution) Cess Act, 1977 (Amended 1992 and 2003): This is an Act to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal Solid Wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems, so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing

and disposal of Municipal solid wastes.

Bio-Medical Waste (Management and Handling) Rules, 1998 (As amended in 2003): These rules apply to all who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals. Section 4 of these rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.

Environment Impact Assessment (EIA) Notification, September 14, 2006: A water supply project does not require prior environment clearance notification as per EIA notification. However, the potable water requirements and services in Industrial estates/parks/complexes/areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes Building (item 7c) and Construction projects, and Townships and Area Development projects. Items are covered under 8 (a) and 8 (b) by the said notification.

Environment Impact Assessment (EIA) Notification, 2006: This notification makes it mandatory for eight categories of projects to prepare Environment Impact Assessment and Environment Management Plan and seek environmental clearance. Area development and construction projects are covered under category 8A and 8B.

State Level Policies / Regulations

State Water Policy: The said Policy states that water, as a resource, is one and indivisible: rainfall, river waters, surface ponds and lakes and groundwater are all part of one system. In Himachal Pradesh, availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul and Spiti district to around 3200 mm in Dharamshala, district Kangra. However, in spite of heavy rain and snow during the rainy season and winter, the summer months are periods of water scarcity in many areas as the flow in the rivers and *nallahs* is quite low and traditional sources also dry up. Thus, through its Water Policy, the State also has to address the issues of drought management in some areas and flood control in others.

The policy states about the requirement of clear guidelines with respect to water related projects. Planning and implementation of water related projects has many socio-economic aspects and issues, such as environmental sustainability, resettlement and rehabilitation of project-affected people and livestock, public health concerns of water impoundment, dam safety etc.

It states that water resources available to the State should be brought within the category of utilisable resources to the maximum possible extent. Groundwater exploitation for domestic use and irrigation will be promoted wherever feasible and improvising of surface water in pondages for usage during lean periods shall be encouraged.

The policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin so that the best possible combination of options can be selected and sustained."

The policy recommends watershed management through extensive soil

conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rests with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the area/basin requirements. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

The State level policy deals with the process and quality of drinking water supply and sanitation means in different areas of the State, mostly in rural sectors. The policy links water harvesting practices in households and community. It assigns duties and responsibilities of *Panchayati Raj* Institutions (PRIs) and Non Government Organizations in source development and water allocation. It stresses on awareness generation for optimal and efficient use of drinking water. Further, the said policy emphasises on non-conventional methods for augmenting the availability of water, such as artificial recharge of groundwater. Traditional water conservation practices, like Rain Water Harvesting, including Roof-top Rain Water Harvesting and use of such water through dual plumbing systems needs to be promoted in all buildings. Pilot projects will be supported for demonstration effect. Research and development in these areas shall also be supported.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should broadly include drinking water followed by irrigation; ecology; afforestation/biodiversity/tourism; agro-industries; hydro-power; non-agro-based industries; and navigation and other uses.

Draft Urbanisation Policy, 2009: The Urbanisation Policy Section 19 outlines the 'Preservation of Environment'. Its Subsection 19.6 states that "no damage to natural drainage shall be caused and a distance, as under mentioned, from the highest flood level shall have to be left from the drainage lines." For rivers, it is 25 metres for *khuds*/streams, it is 10 metres and for *Nallah,* it is five metres.

The State's New Hydropower Policy, 2006: It has made it mandatory to release minimum environmental flow of 15 percent water immediately down-stream of the diversion structures to address issues concerning riparian rights, drinking water, health, aquatic life, wild life, fisheries, silt and even to honour sensitive religious issues, like cremation and other religious rites etc. on the river banks.

HP Forest Sector Policy, 2005: The Forest Sector Policy introduced a 'Forest Sector Concept' where it encompasses the entire biophysical and environmental components comprising lands and biological resources (i.e. watersheds, wetlands, wildlife) and includes the stakeholders and institutions directly or indirectly dependent on or responsible for the management of these resources for livelihood security and sustenance.

The State level Policy on forest development also deals with combating desertification by undertaking various measures, such as, in-situ

soil and water conservation and water harvesting. It also emphasises on Watershed Management.

Tourism Policy, 2005: This Policy document aims to provide clear directions for the development of tourism in the State. It seeks to harness the fullest potential of the State for the development of tourism, which, in turn, can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The Government proposes to replicate the Manali model of green fee collection from tourists in other major tourism destinations. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plans will be created and implemented in time bound manner. Water supply and sanitation are part of the Master Plan.

River/Stream Bed Mining Policy Guidelines for the State of Himachal Pradesh-2004 Notified on 28-2-2004: Under these guidelines, no river/stream bed mining shall be allowed within 75 meters from the periphery of soil conservation works, nursery plantation, check dams, 1/5th of its span or five meters from the bank, whichever is higher, 200 meters up-stream (U/S) and down-stream (D/S) of Water Supply Scheme, 200 meters up-stream and 200 to 500 meters down-stream of bridges, depending upon the site-specific conditions, or within the distance as recommended by the Sub-Divisional Committee, whichever is more.

Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Act, 2005: The State Government has enacted Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act, 2005 (Act No. 31 of 2005) and Himachal Pradesh Ground Water (Regulation and Control of Development and `Management) Rules, 2006. These rules grant permits for digging of well and use of groundwater for domestic and irrigation purposes.

The Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implement the provisions of the Act, may (a) Issue guidelines for adoption of rain water harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for ground water management in rural and urban areas; (d) undertake Information, Education and Communication (IEC) activities, such as workshops, seminars, public discourses, debates, radio and television programmes to promote rain water harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of rain water harvesting for groundwater recharge in the notified areas provided that in urban areas within the notified area, no directions issued under these rules shall be applicable for construction of rain water harvesting structures: (a) in residential or commercial premises having plinth area of less than100 square meters; or (b) in the sinking zones, where construction of rain water harvesting structures would be detrimental to the safety of the building structures in the area .

The Himachal Pradesh Town and Country Planning Act, 1977: This Act makes provision for planning and development and use of land to make better provision for the preparation of development plans and sectoral plans with a view to ensuring that town planning schemes are made in a proper manner and their execution is made effective; to constitute the Town and Country and Development Authority for proper implementation of town and country

development plans; to provide for the development and administration of special areas through the Special Area Development Authority; to make provisions for the compulsory acquisition of land required for the purpose of the development plans and connected purposes.

The Act mandates preparation of development plan, regional plan and sectoral plans and tourist development schemes. The development of these plans mandates (a) requirements and suggestions for development of public utilities, such as water supply, drainage and electricity.

A development plan shall consist of (i) residential, industrial, commercial or agricultural purposes; (ii) open spaces, parks and gardens, green belts, zoological gardens and play-grounds; (iii) lay down the pattern of National and State Highways connecting the planning area with the rest of the region, ring roads, arterial roads and other major roads within the planning area; (iv) project the requirement of the planning area of such amenities and utilities as water, drainage, electricity and suggest their fulfillment; (v) lay down broad-based traffic circulation patterns in a city; (vi) indicate measures for flood control, prevention of air and water pollution, disposal of garbage and general environmental control.

The Himachal Pradesh Municipal Act, 1994: This is an Act to consolidate, amend and replace the law relating to Municipalities in Himachal Pradesh. Under the provisions of Subsection (1) of Section 47, the State Government shall, by notification, endow the Municipalities with such powers and authorities as may be necessary from time to time to enable them to function as institution of Local Self Government with respect to: (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and implementation of schemes, which may be entrusted to them including (1) urban and town planning; (2) planning for economic and social development; (3) water supply for domestic, industrial and commercial purposes; and (4) public health, sanitation conservancy and solid waste management.

The Municipal fund shall be applicable to the payment, in whole or in part, of the charges and expenses incidental to matters within the Municipal area and with the sanction of the State Government outside the Municipal area, namely: (a) the construction, maintenance, improvement, cleansing and repair of all public streets, bridges, town-walls, town-gates, embankment, drains, privies, latrines, urinals, tanks and watercourses and the preparation of compost manure; the watering and lighting of such streets or any of them; and the supply, storage and preservation of water from pollution for the use of people or animals.

Provisions for water supply: (1) The Municipality may, and when the State Government so directs, shall provide the area under the control or any part thereof with a supply of wholesome water sufficient for public and domestic purposes; (2) for the purpose of providing such supply within the Municipality, shall cause such tanks, reservoirs, engines, pipes, taps, and other works as may be necessary to be constructed or maintained, whether within or outside the Municipal area, and shall erect sufficient standpipes or other conveniences for the gratuitous supply of water to the public; (3) when required by the Health Officer, the Municipality shall arrange for the examination of water supplied for human consumption for the purpose of determining whether the water is wholesome.

Supply of water for domestic purposes: (1) The Municipality may, on application by the owner of any building, arrange for supplying water from the nearest main to the same for domestic purposes in such quantities as it deems reasonable and may, at any time, limit the amount of water to be so supplied whenever it considers it necessary; (2) no additional charge shall be payable in respect of such supply in any Municipal area in which a water tax is levied, but for water supplied in

excess of the quantity to which such supply is under Sub-section (1) limited;, and in other Municipal areas for all water supplied under this Section, payment shall be made at such rate as may be fixed by bye-laws.

Supply of Water for other than Domestic Purposes: (1) The Municipality may supply water for any purpose other than domestic on receiving a written application specifying the purpose for which such supply is required and the quantity likely to be consumed; provided that for building purposes, water supply shall be made for a period of one year, in the first instance, on an application accompanied by a copy of a building plan duly sanctioned by the competent authority and, thereafter, be extended by six months at a time for a period not exceeding the period allowed for the completion of the constriction or for three years, whichever is less; provided further that the water supply made for the building purposes, on or before the commencement of this Act, shall continue for a period of three years reckoned from such commencement; (2) for all water supplied under Sub-section (1) payment shall be made at a rate not less than the rate prescribed under Sub-section (2) of Section 101; (3) the Municipality may withdraw such supply at any time if it should appear necessary to do so in order the maintain sufficient supply of water for domestic purposes.

Procedure for Water Connections: (1) Where an application under section 101 or section 102 has been received, all necessary communication pipes and fittings shall be supplied by the Municipality and the work of laying and applying such communication pipes and fittings shall be executed by Municipal agency under the Municipality orders; but the cost of making any such connection and of all communication pipes and fittings so supplied and of all works so executed shall be paid by the owner or the person making such application. The Municipality may either provide a meter and charge rent for the same or may require the owner or applicant to provide a meter of such size, material and description as it shall approve; (2) notwithstanding anything in Sub-section (1), the Municipality may require any owner or person applying for a supply of water to provide all communication pipes and fittings and to carry out, at his own cost and under its supervision and inspection, all the work of laying and applying such communication pipes and fittings.

Obligation of owner or occupier to give notice for wastage of water: Any owner or occupier of any building or land in or on which water supplied under this Act is misused from negligence or other circumstances under his control, or used without permission in excess of the quantity fixed under Sections 101 or 102, or in which the pipes, mains, or other works are out of repair to such an extent as to cause wastage of water, shall if he has knowledge thereof, be bound to give notice of the same to such officer as the Municipality may appoint on its behalf.

Cutting off Water Supply to Premises: If any person, whose premises are supplied with water, neglects to pay the water-tax, or any sum payable under Sections 101 or 102 when due, or to give notice as provided in the last proceeding Section or willfully or negligently misuses or causes waste of water, the Municipality may, after due notice, cut off the supply of water from the said premises.

Power to Require Building Owners to Provide Storage Reservoirs for Rain Water on their Premises: (I) Whenever it appears to the Municipality or the State Government desirable to require the owners of buildings or lands, situated within the limits of the whole or any part of a Municipal area, to make suitable provision for the storage and conservation of rain-water for use in flushing drains and for any purposes other than for the purpose of being used as drinking water, such Municipality, if so required by the State Government, shall, and, in any other case, may, with the previous sanction of the State Government, by public notice, direct accordingly; (2) every notice, given under Sub-

section (I) shall state (a) the extent of the local area within the limits or which owners of buildings and lands are to make suitable provision for the storage of rain-water; (b) the manner in which the cubic capacity of the store accommodation to be provided by such owners is to be fixed, that is, whether the extent of such capacity is to be regulated by reference to the land area, the size of the building, the number of occupants, or the estimated rental value thereof or by any two or more of these methods; (c) the design, materials, situation and construction of the reservoirs or other storage accommodation to be provided; (d) the mode of collecting, storing, preserving from pollution and in a pure state and using the rain water to be collected and stored; and (e) the time within which the requirements of the notice are to be complied with.

Repairs of Reservoirs: The Municipality may, by notice, require the owner or occupier of any building or land in respect of which a reservoir for the storage and conservation of rain water has been provided under Section 107 to repair, alter or put in good condition the said reservoir.

The Municipality may set apart suitable places for the purpose of bathing and may specify the times at which and sex of the persons by whom such places may be used and may also set apart suitable places for washing animals or clothes, or for any other purpose connected with the health, cleanliness or comfort of the inhabitants; and may, by public notice, prohibit bathing or washing animals or clothes in any public place not so set apart, or at times or by persons other than those specified, and any other act by which water in public places may be rendered foul or unfit for use, and may charge fees for the use of such places by any specified class or classes of persons or by the public generally. The Municipality may fix, by notice, places at which articles of clothing, bedding or other articles, which have been exposed to infection shall be washed, and no person shall wash any such article at any place not so fixed.

Provisions of Drains, Privies: (1) The Municipality may, by notice, require the owner of any building or land to provide, move or remove any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse, or provide any additional drains, privies, latrines, urinals, cesspools or other receptacles as aforesaid, which should, in its opinion, be provided for the building or land in such manner and of such pattern as the Municipality may direct; (2) The Municipality may, by notice, require any person employing more than twenty workmen or labourers to provide such latrines and urinals as it may think fit and to cause the same to be kept in proper order and to be cleaned daily; (3) the Municipality may, by notice, require the owner or occupier of any building or land to have any privy, latrine or urinal provided for the same shut out by a sufficient roof and wall fence from the view of persons passing by or dwelling in the neighbourhood, or to remove or alter, as the Municipality may direct, any door or trapdoor of a privy, latrine or urinal opening on to any street or drain; and (4) The Municipality may, and when required by the State Government, shall provide latrines and urinals for the use of public.

Repair and Closing of Drains, Privies: (1) The Municipality may, by notice, require the owner or occupier of any building or land to repair, alter, or put in good order any drain, privy, latrine. urinal, cesspool or receptacle for any filth or refuse, or to close any drain, privy, latrine, urinal or cesspool belonging thereto; (2) the Municipality may, by notice, require any person, who has constructed any new drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse without its permission in writing or contrary to its directions or regulations or the provisions of this Act, or who has constructed, rebuilt or opened any drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse, which it has ordered to be demolished or stopped or not to be made, to demolish the drain, privy, latrine, urinal, cesspool, receptacle or to make such alteration therein as it may think fit.

Unauthorised Building over Drains:_ The Municipality may, by notice, require any person, who, without its permission in writing, has newly erected or rebuilt any building over any sewer, drain, culvert, water course or water pipe vested in the Municipality, to pull down or otherwise deal with the same as it may think fit.

Removal of Latrines etc. near any Source of Water Supply: (1) The Municipality may, by notice, require any owner or occupier on whose land any drain, privy, urinal, cesspool or other receptacle for filth or refuse exists, for the time being, within fifteen metres of any spring, well, tank, reservoir or other sources from which water is or may be derived for public use, to remove or close the same within one week from serving of such notice; (2) whoever, without the permission of the Municipality makes or keeps, for a longer time than one week after notice under this Section, any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse, within fifty feet of any spring, well, tank, reservoir or any other source from which water is or may be derived for public use, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees, and when a notice has been issued, with a further fine of ten rupees for each day during which the offence is continued after the lapse of the period allowed for removal.

Discharging Sewerage: Whoever, without the permission of the Municipality, causes or knowingly or negligently allows the contents of any sink, sewer, or cesspool or any other offensive matter to flow, drain or be put upon any street or public place, or into any irrigation channel or any sewer or drain not set apart for the purpose, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees.

Making or Altering Drains without Authority: Whoever, without the permission of the Municipality makes or causes to be made,oraltersorcausestobealtered,any drain leading into any of the sewer or drains vested in the Municipality, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees.

Power to Require Removal of Nuisance Arising from Tanks and Lakes: The Municipality may, by notice, require the owner or occupier of any land or building to cleanse, repair, cover, fill up or drain off any private well, tank, reservoir, pool, depression or excavation therein, which may appear to the Municipality to be injurious to health or offensive to the neighborhood; provided that if for the purposes of effecting any drainage under this section, it should be necessary to acquire any land not belonging to the same owner or to pay compensation to any person the Municipality shall provide such land or pay such compensation.

Connection with Main not to be Made without Permission of Municipality: (1) No person shall, without the permission of Municipality, at any time make, or cause to be made, any connection or communication with any cable, wire, pipe ferrule, drain, sewer or channel constructed or maintained by or vested in the Municipality, for any purpose whatsoever; (2) any person acting in contravention of the term of Sub-section (1) shall be punishable with a fine, which shall not be less than twenty five rupees and more than two hundred rupees.

Sewerage connection: (1) The Municipality may, at any time, establish any connection or communication from any water-main, drain or sewer to any premises, or may, by notice, require the owner of any such premises to establish any such connection or communication in such manner and within such times as the Municipality, by notice on that behalf, may prescribe at the cost of such owner or occupier; (2) notwithstanding anything contained in Sub-section (1), it shall be the duty of the house owner or occupant of any premises to connect his latrines, urinals and septic tank, as the case may be, with sewerage line where sewerage system has been provided by the Municipality, at his own

expenses, by getting sewerage connection from the Municipality and if he fails to do so, he shall be punishable with fine, which may extend to two thousand rupees, but shall not be less than five hundred rupees, in addition to other charges for such connection, which, in case of continuous default, will result in disconnection of essential services, viz. water, electricity etc.; provided that where sewerage line is passing through other person's land, the sewerage connection shall be connected to the sewerage line through the boundary lines of such land or where the building has been constructed, the line shall be laid through the setbacks of such building, whichever is feasible.

Troughs and Pipes for Rain Water: *(*1) The Municipality may, by notice, require the owner of any building or land in any street to put up and keep in good condition proper troughs and pipes for receiving and carrying water and sullage from the building or land and for discharging the same so as not to cause inconvenience to persons passing along the street; (2) for the purpose of efficiently draining any building or land, the Municipality may, by notice in writing, (a) require any courtyard, alley or passage between two or more buildings to be paved by the owner or part-owner of such buildings with such materials and in such manner as may be approved by the Municipality; and (b) require such paving to be kept in proper repair.

Prohibition by Municipality of Use of Unwholesome Water: Should the Municipality, on the report of the Health Officer, consider that the water in any well, tank or other place is likely, if used for drinking, to endanger or cause the spread of any dangerous disease, it may, *(a)* by public notice, prohibit the removal or use of such water for drinking; *(b)* by notice, require the owner or person having control of such well, tank or place to take such steps as may be specified in the notice to prevent the public from having access to or using such water; or *(c)* take such steps, as it may, on the advice of the Health Officer, which are considered expedient to prevent the danger or spread of any such disease.

The Himachal Pradesh Municipal Business Bye-Laws, 2006: The General Standing Committee shall perform functions relating to: (a) establishment matters; (b) communication of general nature; (c) building regulations etc.; (d) urban housing projects etc.; (e) relief against natural calamities; (f) water supply for the town; (g) to enquire and report on all matters relating to Municipal works, maintenance and verification of Municipal and nazul properties, roads and buildings under the control of the Municipality. It shall also supervise all Municipal works connected with buildings, road, drains etc.

The Municipal Medical Officer of Health shall be in charge of the Sanitation, Public Health and Health Departments of a Municipality. He shall supervise the sanitary conditions of all buildings and lands, burial and burning places, markets, slaughter houses, streets, drains, sewerages, latrines, urinals, filth receptacles, cesspools, flushing appliances, farms, filth depots, dairies, milk shops, cow sheds, stables, meat shops and all shops dealing in edibles, bakeries, aerated water factories, wells and *dhobi ghats*etc. He shall also check the houses unfit for human habitation, offensive trades, foods and drinks, plants and stores.

The Municipal Engineer shall be in charge of the Engineering and Building Department. He shall be responsible for house connections of filtered water, supply system, road lighting, water meters, Municipal lands and properties, machinery, plants and stores and shall maintain registers and stock books laid down in the Municipal Accounts Code and the Municipal Works Rules.

Notification No. IPH-B(C) 10-1/2004, Dated: Shimla-1712002, the 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), different charges applicable are given below in Table 4.

Table 4: Rural Water Supply Sector

	Domestic rate	Commercial rate
Connection charges	Rs. 100/-	Rs. 200/-
Consumption charges	Rs. 10/- per connection per month	Rs. 8 per KL subject to minimum of Rs. 100/- per month

This tariff will increase by 10 percent on the 1st of April every year.

Notification No. IPH-B(F)2-2/2004, Dated: Shimla-1712002 , the 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), the following rates are applicable for Water Supply by the Irrigation & Public Health Department in all *Nagar Panchayat* and Municipal Committee areas except Solan, Palampur and Municipal Corporation, Shimla w.e.f. 1.6.2005.

	Domestic rate	Commercial rate
Connection charges	Rs. 300/-	Rs. 500/-
Consumption charges	Rs. 4/- per KL	Rs. 8 per KL

The tariff for water consumption shall be increased by 10 percent with effect from 1st April every year.

Notification No. IPH-B(F)5-4/2004, Dated: Shimla-1712002, 15/6/2005: Under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), the following rates are applicable for bulk supply of drinking water by Irrigation and Public Health Department in Himachal Pradesh as under w.e.f. 1.6.2005.

Table 5: Charges for Bulk Supply by IPH to Municipal Committees

	Rate
Bulk supply for Shimla Municipal Corporation.	Rs, 8/- per KL
Bulk supply for Solan Municipal Committee.	Rs. 8/- per KL
Bulk supply for Palampur Municipal Committee.	Rs. 4/- Per KL

The rates will increase by 10 percent on the 1st of April every year.

Notification No. IPH-B (F) 10-3/2004, Dated, Shimla-2, 23.3.3007: A penal levy for non metering of domestic drinking water connection @ of Rs. 60 per connection per month will be charged within two months from the issuance of this Notification to ensure that meters are installed. This rate will be doubled every four months in the event of continued non- metering.

Commercial urban and rural consumers of drinking water will install the meters within one month from the date of this notification. Till then, the average consumption being charged at present will continue. If meters are not installed within one month, the average rate of consumption charges will be doubled. To ensure the installation of meters, this rate will double every two months, thereafter.

The Himachal Pradesh Housing and Urban Development Authority Act, 2004: This Act seeks to re-enact the law to provide for the creation of a Development Authority to plan and develop land and create infrastructure to meet with the housing needs of different income groups and to provide for development schemes for mobilising public and private resources for the promotion of housing colonies and related infrastructure and to provide for the creation of appropriate authority and mechanisms for planned development of housing colonies.

A development scheme may provide for (a) drainage, water-supply and lighting of the area included in the scheme; and (b) sanitary arrangements required for the area comprised in the scheme including the conservation and prevention of any injury or contamination to rivers or other sources and means of water supply.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This is an Act to consolidate, amend and replace the law relating to *Panchayats* with a

view to ensure effective involvement of the *Panchayati Raj* Institutions in local administration and developmental activities.

Chapter III of this Act describes the framing and finalising of schemes for execution. The housing and development schemes may be one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the functions, such as (a) mobilizing voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identifying beneficiaries for the implementation of developmental schemes pertaining to the village; and (c) rendering assistance in the implementation of developmental schemes pertaining to the village, such as:

- Approving plans, programmes and budget, prepared by the *Gram Panchayat*, for economic development and social justice.
- Authorizing after being satisfied, issuance of utilization certificate of funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals, as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for the maintenance and repair (a) deepen or otherwise improve water ways; and (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing other acts, which are likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation at the village level by the *Gram Panchayat*; and (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Management of Minor Water Bodies in the Scheduled Area: Planning and management of minor water bodies in the scheduled areas shall be entrusted to *Gram Panchayats*, *Panchayat Samitis* or the *Zila Parishads*, as the case may be, in such manner as may be prescribed.

Chapter-XII of this Act describes the preparation of development plans and the role of the District Planning Committee. Preparation of development plans include steps, such as (1) every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute a District Planning Committee in every district to consolidate the plans prepared by the *Zila Parishad*, *Panchayat Samitis*, *Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This is an Act to prevent throwing or depositing non-

biodegradable garbage in public drains, roads and places open to public view and to regulate the use of non-biodegradable material in the State. The Act prohibits throwing of degradable garbage in public drains and sewage and has provision for placement of receptacles and places for depositing non-biodegradable garbage. It defines the duty of owners and occupiers to collect and deposit non-biodegradable garbage etc. and defines the power of local authority for removal of non-biodegradable garbage. It stresses on studies, research and support programmes.

State's Sector Reforms: Reforms in Rural Drinking Water Supply Sector were adopted in 1999 in the country and Pilot Projects were taken up in selected 67 Districts of 26 States. The basic concepts of reforms include community participation in the planning, implementation, operation and maintenance of schemes of its choice.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This Act defines the functions of the Tourist Development Board under Section 8 of Chapter II. Section 17, Chapter III of the Act describes the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the function of the Council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spot, environmental upgradation etc., assist the local body in maintaining sanitation and infrastructure facilities at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities, prepare a Tourism Master Plan for its area and all tourism units and establishment shall conform to the Master Plan.

Other Sub-programmes / Strategies

Central Rural Sanitation Programme (Total Sanitation Campaign): The concept of sanitation was earlier limited to disposal of human excreta by cesspools, open ditches, pit latrines, bucket system etc. Today, it connotes a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, personal, domestic as well as environmental hygiene. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal.

The 'Total Sanitation Campaign (TSC)' emphasises more on Information, Education and Communication (IEC), Human Resource Development, Capacity Development activities to increase awareness among the rural people and generation of demand for sanitary facilities.

The main objectives of the TSC are to: bring about an improvement in the general quality of life in the rural areas; accelerate sanitation coverage in rural areas; generate felt demand for sanitation facilities through awareness creation and health education; cover schools/Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students; encourage cost effective and appropriate technologies in sanitation; eliminate open defecation to minimise risk of contamination of drinking water sources and food; convert dry latrines to pour/flush latrines, and eliminate manual scavenging practices, wherever in existence in rural areas.

Implementation of TSC is proposed on a project mode. A project proposal emanating from a district is scrutinised by the State Government and transmitted to the Government of India (Department of Drinking Water Supply, Ministry of Rural Development). TSC is implemented in phases with start-up activities. Funds are made available for preliminary IEC work. The physical implementation gets oriented towards satisfying the felt-needs, wherein individual households choose from a menu of options for their household latrines.

Jawahar Lal Nehru Urban Renewal Mission (JNNURM): JNNRUM was launched in the month of December, 2005 for developing basic urban infrastructure and urban slum development in 63 cities of India.

The objectives of JNNURM are to: assist cities achieve focused attention to integrated development infrastructure services and meet the deficiencies in infrastructure projects; and secure effective long term sustainability of projects by establishing linkages between asset creation and management through reforms, so that the infrastructural services created in the cities are not only maintained efficiently but also become self-sustaining over time.

The duration of the Mission is seven years starting from the year 2005-06 and on its completion, it is expected that a city would have achieved: modern and transparent budgeting, accounting, financial management systems, designed and adopted for all urban service and governance functions; city wide framework for planning and governance will be established and become operational; all urban residents will be able to obtain access to a basic level of urban services; financially self sustaining agencies for urban governance and service delivery will be established through reforms in major revenue instruments; local services and governance will be conducted in a manner that is transparent and accountable to citizens; and E-governance applications will be introduced in core functions of ULB/parastatal, resulting in reduced cost and time of service delivery; the Mission encourages the leveraging of funds available under JNNURM assistance by enhancing the resource availability with ULBs/parastatal, commercial viability and bankability of the projects and by incorporating Private Sector efficiencies in development, financing, implementation and management of projects.

Urban Renewal includes redevelopment of inner (old) city areas, which would include items, like widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner-city) areas to conforming (outer-city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal system etc. Land acquisition cost will not be financed under this component of the programme. It also includes water supply including setting up de-salination plants, where necessary; sewerage and solid waste management; construction and improvement of drains/storm water drains; urban transport; laying/improvement/widening of arterial/sub-arterial roads and bridges to remove transport bottlenecks; laying of ring roads and by-passes around metro and mega cities, provided certain cost recovery measures, like toll charges are built in; construction and development of bus and truck terminals; environmental improvement and city beautification schemes; construction of working women hostels, marriage hall, old age and destitute children's homes, night shelters with community toilets etc.

For special category States like Himachal Pradesh, the pattern of funding is 80 percent by Government of India, 10 percent by State Government and 10 percent by local Municipality.

Under JNNURM scheme, Shimla town has been covered for undertaking different activities. These activities include setting up of Solid Waste Management Improvement of Shimla city; rehabilitation of water supply distribution system for Shimla city; and rejuvenation of sewerage network in missing lines and left out areas.

Rajiv Gandhi Urban Renewal Facility (RGURF): In order to strengthen the urban infrastructure and clean environment in urban areas of the State, this scheme was launched in 2006-07 for infrastructure and sanitation improvement in all urban areas of the State other than Shimla. The main objectives of the scheme are infrastructure and sanitation improvement in all urban areas of the State.

The components of the scheme are: management of urban solid waste; parking lots within the towns for cars etc. and on the fringe of the town for trucks. The truck parking facilities shall also integrate the workshops, *dabhas* and other eateries, common civic amenities etc. The land for such parking lots shall have to be provided by the local bodies and the State Government shall not make any provision for cost of land; setting up of new public amenities by way of community toilets within the existing towns, especially in the proximity of bus stands, hospitals, main shopping areas etc. The new community toilets shall be on a lease/contract basis with M/s Sulabh International that already has its presence in the State; development of parks within the existing towns; and the Urban Local Bodies shall get detailed project report prepared for each proposal. The cost of Detail Project Reports could also be an integral part of the overall project cost and its funding.

The funds will be provided to Municipal Council/*Nagar Panchayat* on 'first come first serve basis' as 95 percent Government Grant of total Detail Project Report cost and remaining five percent is to be borne by the Municipality out of its own resources under Rajiv Gandhi Urban Renewal Facility (RGURF) for infrastructure and sanitation improvement in urban areas. During the financial year 2010-11, there is a budgetary provision of Rs. 671.00 lakhs under this scheme for infrastructure and sanitation improvement in urban areas.

Environmental Improvement of Urban Slums (E.I.U.S): Environmental Improvement of Urban Slums (E.I.U.S.I) and National Slum Development Programme (NSDP) were launched in Himachal Pradesh during 1982-83 and were being implemented by Town & Country Planning Department till 1998-99. The scheme had been transferred to the Directorate of Urban Development during the year 1999-2000 for further implementation. This programme falls under Special Component Plan (SCP) on which 50 percent budget is being utilised every year.

The aims and objectives of the scheme are to improve the environmental condition of 2.50 lakhs slum dwellers living in 374 slum pockets in 49 Urban Local Bodies of the State. This is being carried out by way of providing community facilities, such as path, drain, *Raen Baseras* (night shelters), toilets, street lights, parks, roads and storm water drains (gutters) etc. to benefit the slum population of Himachal Pradesh.

The State scheme shall first get sanctioned in a State level project committee, which shall be set up for this purpose by the State Government concerned and shall have one representative from the Department of Urban Employment & Poverty Alleviation, which is the nodal Department for this scheme.

At the district level, the Deputy Commissioner of the district monitors the quarterly progress under this programme; at the State level, the State Government monitors the progress under this programme and at the National level, the Department of Urban Employment and Poverty Alleviation of Government of India monitors the progress under this programme.

The funds for this scheme are being received through State Plan Budget under head 2217-Urban Development. The Social Justice and Empowerment Department has been declared as the Administrative Department for the implementation of this scheme under the Scheduled Caste Sub-Plan of the State Budget.

During the year 2009-10, Rs 244.00 lakhs were released to the ULBs under Environment Improvement of Urban Slum (EIUS) scheme to benefit 3300 BPL families by providing basic amenities and infrastructure, viz. community taps, hand pumps, street lights, community bathrooms and latrines, roads, pavements, sewerage and storm water drainage, *Raen Baseras* etc. in slum areas. A budget provision of Rs. 294.00 lakhs to benefit 3600 slum families in the financial year 2010-11 was under this scheme.

Integrated Housing & Slum Development Programme (IHDSP): This scheme was launched on 3rd December, 2005. The basic objective of the scheme is to strive for slum-less cities by adopting holistic slum development with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.

The components for assistance under the scheme will include all slum improvement / upgradation / relocation projects including upgradation/new construction of houses and infrastructural facilities; provision of shelter including upgradation and construction of new houses; provision of community toilets; and water supply and sewerage. The cost of land for such projects will not be provided under the programme and has to be borne by the State Government. In case the project is to be undertaken on a private land, which is to be acquired by the State, the cost of land may also be the part of the project costing only in the case of North Eastern States and the hilly States of Himachal Pradesh, Uttarakhand and Jammu and Kashmir; for the provision of physical amenities, like water supply, storm water drains, community bath, widening and paving of existing lanes, sewers, community latrines, street lights etc.

The scheme will apply to all towns and cities excepting cities/towns covered under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). Allocation of funds among States will be on the basis of the ratio of State's urban slum population to total urban slum population in the country. The funds will be provided only to those towns and cities where election to the local bodies have been held and elected bodies are in position. The sharing pattern for the hilly State like Himachal Pradesh is 80 percent by the Central Government, 10 percent by the State Government and the remaining 10 percent by the financial institutions.

Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT): In December, 2005, Government of India launched a new scheme namely Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSMT) by subsuming the existing schemes of IDSMT (Integrated Development of Small and Medium Towns) and AUWSP (Accelerated Urban Water Supply Programme). Admissible components include: urban renewal i.e. redevelopment of inner (old) city areas. This includes widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner city) to conforming (outer city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal systems etc.; water supply (including de-salination plants) and sanitation; sewerage and solid waste management; construction and improvement of drains/storm water drains; parking lots/spaces on Public Private Partnership basis and the preservation of water bodies. The Project is to be prepared by the Urban Local Bodies with 80 percent Central government share, 10 percent State Government share and 10 percent Urban Local Bodies share. Government of Himachal Pradesh has declared HIMUDA as the nodal agency for the preparation and execution of the UIDSSMT Scheme.

Nodal agency will be Responsible for inviting project proposals from Urban Local Bodies / Parastatal / implementing agencies; techno-economic appraisal of the projects either through in-house expertise or by outside agencies through outsourcing; management of funds received from Central and State Governments; disbursement of the funds; furnishing of utilisation certificates within 12 months of the closure of the financial year and quarterly physical and financial progress reports to the Ministry of Urban Development; maintenance of audited accounts of funds released to the Urban Local Bodies and implementing agencies; and monitoring of implementation of reforms and infrastructure projects.

It is mandatory that before the project is submitted for approval to the Government of

India, the State Government and Urban Local Bodies will have to accept the implementation of reforms agenda. The proposed reforms shall broadly fall in two categories: a) mandatory reforms by State Government and the Urban Local Bodies and b) optional reforms by State Government and the Urban Local Bodies.

Urban Water Supply: It is mentioned in Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT)

Rural Water Supply: As on 1st April, 2007, only 1407 partially covered habitations were left to be covered with safe drinking water facilities in the State. The proposed outlay for Eleventh Five Year Plan (2007-12) has been kept at Rs. 72616.00 lakhs with a target to cover 3000 habitations under State sector.

There are district level programmes, like *Vikas Mein Jan Sahayog* (people's contribution towards development) in which communities or individuals contribute about 25 percent of the amount for infrastructure development and the rest is contributed by the Government.

The Government has made it mandatory to construct Rain Water Harvesting structures in all the buildings in the State. Government is implementing various watershed schemes through its Development Departments with the involvement of the Panchayati Raj Institution and the community.

Department of Rural Development implements watershed and other water supply programmes, develops the micro watersheds and has bearing on development and conservation of water resources.

National Rural Employment Guarantee Scheme: The National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective w.e.f. 2nd February 2006. The focus of the scheme is on the following works in their order of priority: water conservation and water harvesting works; drought proofing works (including afforestation and tree plantation); irrigation canals including micro and minor irrigation works; provision of irrigation facilities, horticulture, plantation and land development facilities on the lands owned by households belonging to the Scheduled Caste and Scheduled Tribes or Below Poverty Line (BPL) families or beneficiaries of land reforms or the beneficiaries under the *Indira Awas Yojana* of the Government of India; renovation of traditional water bodies including desilting of tanks; land developments works; flood control and protection works including drainage in water logged areas; rural connectivity to provide all-weather access. Till September 2010, about 422 works have been completed, while 12310 works are in progress on water conservation and water harvesting structures; about 234 works have been completed and 3842 are in progress for renovation of traditional water bodies; 16 works have been completed and 751 are in progress for drought proofing; 218 works have been completed and 9650 works are in progress in the area of irrigation canals; 70 works have been completed and 118 works are in progress for providing irrigation facilities to SC/ST/IAY/LY; and 367 works have been completed, while 6840 works are in progress for land development.

Establishment of Parivar Kalyan Salahkar Samiti (PARIKAS): Himachal Pradesh has set up health and family welfare advisory committees known as *Parivar Kalyan Salahkar Samiti* (PARIKAS) at the *Panchayat*, block and district levels for the involvement of the PRIs. The functions of the *Panchayat* PARIKAS include supervision and monitoring; implementation of national health programmes; ensuring cleanliness of the villages; checking pollution of water, air and noise; making people aware of dog and snake bites and their first aid treatment; and cleaning and using bleaching powder etc.

National Lake Conservation Plan (NLCP), 2001: Recognising the importance of lakes, the Ministry of Environment and Forests,

Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The scheme was approved by the Government of India during the IX Plan (June 2001) for 100 percent Central grant. Funding pattern under NLCP has since been changed w.e.f. February, 2002 from 100 percent Central funding to 70:30 cost sharing between the Central Government and the concerned State Government.

The objective of the Scheme is to restore and conserve the urban and semi-urban lakes of the country degraded due to waste water discharge into the lakes and other unique freshwater ecosystems, through an integrated ecosystem approach. Unique fresh water ecosystems cover lakes that are unique entities of incomparable values and need to be preserved and conserved, e.g., high altitude lakes, Lonar lake in Maharashtra etc.

Health Vision 2008: The Health Vision 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for the attainment of targets. The primary goal of Vision 2008 is to achieve the status – Health for All.

The Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen the existing system to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.

Sewerage development plan is being administered by the Urban Development Department instead of the Irrigation and Public Health (I&PH) Department w.e.f. 1.4.2008. Hence, the previous programme under this head and activities prepared for the annual plan 2008-09 are for 56 towns in Himachal Pradesh, out of which 49 towns are under I&PH Department. Six towns (Yol, Bakloh, Kasauli, Sabhatu, Dagshai and Dalhousie Cantonment) are under Cantonment Boards and Parwanoo is under the Housing Board. Sewerage schemes for 13 towns namely, Sh. Naina Deviji, Chamba, Mandi, Bilaspur, Palampur, Rohroo, Shimla, Manali, Ghumarwin, Jawalamukhi, Arki, Jogindernagar and Rampur two rural/tribal schemes Sarahan and Reckong Peo, respectively, have been completed up to 31st March, 2007. Proposed outlay for eleventh plan period (2007-12) is Rs 17060.00 lakhs to complete sewerage schemes of twelve towns. These schemes will assist in the prevention of water body pollution.

Rural Tourism Infrastructure Development Scheme: Under this Scheme, thrust will be to promote village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions. Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be on tapping the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/Departments of the Government of India.

Scheme for Support to Public Private Partnerships (PPP) in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet these criteria: (a) the project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a private sector company to be selected by the Government or a statutory entity through a process of open and competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the empowered committee may relax this eligibility criterion; (b) International Convention Centres

and other tourism infrastructure projects; provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total project cost. Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 crores (Rs. One Hundred Crore) for each project may be sanctioned by the Empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 crore (Rs. Two Hundred Crore) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 crore may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

2.3 Health

The policies and laws applicable and/or related to the health sector of the State along with a brief description of their relevance are detailed below. These policies, laws, sub-programmes and strategies provide operating framework for the sector to address issues, causes and impacts. Detailed explanations can be acquired from the websites of relevant Departments and line Ministries like Ministry of Environment and Forest (MoEF) (www.envfor.nic.in), Ministry of Health and Family Welfare (www.mohfw.nic.in) and Department of Health and Family Welfare, Himachal Pradesh (http://hphealth.nic.in).

National Level Policies /Regulations

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralised public health system by establishing new infrastructure in deficient areas and by upgrading the infrastructure in the existing institutions. The policy states that overriding importance would be given to ensure a more equitable access to health services across the social and geographical expanse of the country. It is expected that this initiative will strengthen the capacity of the Public Health Administration at the State level to render effective service delivery.

- The Policy envisages that the food and drug administration will be progressively strengthened in terms of both laboratory facilities and technical expertise. Also, the Policy envisages that the standards of food items will be progressively tightened up at a pace, which will permit domestic food handling/manufacturing facilities to undertake the necessary upgradation of technology. The Policy envisages that ultimately food standards will be close, if not equivalent, to Codex specifications and that drug standards will be at par with the most rigorous ones adopted elsewhere.
- The Policy hoped that the independently stated policies and programmes of the environment related sectors would be smoothly interfaced with the policies and the programmes of the health sector in order to reduce the health risks to the citizens and the consequential disease burden.
- The policy lays great emphasis upon the implementation of public health programmes through Local Self-Government institutions. In order to alleviate the acute shortage of medical personnel with specialisation in the disciplines of 'public health' and 'family medicine', the policy envisages the progressive implementation of mandatory norms to raise the proportion of postgraduate seats in these disciplines in medical training institutions. Since the 'public health' discipline has an interface

with many other developmental sectors, specialisation in public health may be encouraged not only for medical doctors, but also for nonmedical graduates from the allied fields of public health engineering, microbiology and other natural sciences.

- The Policy also highlights the need for developing the capacity within the State public health administration for scientific designing of public health projects, suited to the local situation. This policy recognises the need for more frequent in-service training of public health personnel at the level of medical officers as well as paramedics. Such training would help to update the personnel on recent advancements in science and would also equip them for their new assignments, when they are moved from one discipline of public health administration to another.
- This Policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognises the significant contribution made by NGOs and other institutions of the Civil Society in making available health services to the community. It also emphasises the need to simplify procedures for Government and Civil Society interface in order to enhance the involvement of Civil Society in public health programmes.

National Rural Health Mission (2005-12): The National Rural Health Mission (NRHM) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 States including Himachal Pradesh, which have weak public health indicators and/or weak infrastructure.

- It aims to undertake architectural correction of the health system to enable it to effectively handle increased allocations as promised under the National Common Minimum Programme and promote policies that strengthen public health management and service delivery in the country.
- It has, as its key components, provision of a female health activist in each village; a village health plan prepared through a local team headed by the Health and Sanitation Committee of the *Panchayat*; strengthening of the rural hospital for effective curative care made measurable and accountable to the community through Indian Public Health Standards (IPHS) and integration of vertical Health and Family Welfare Programmes and funds for optimal utilization of funds and infrastructure and strengthening the delivery of primary healthcare.
- It seeks to revitalize local health traditions and mainstream AYUSH into the public health system. It aims at effective integration of health concerns with determinants of health, like sanitation and hygiene, nutrition, and safe drinking water through a district plan for health.
- It seeks decentralization of programmes for district level management of health.
- It seeks to address the inter-State and Inter-District Disparities, especially among the 18 high focus States, including un-met needs of public health infrastructure.
- It seeks to improve access of rural people, especially poor women and children, to equitable, affordable, dependable and effective primary healthcare.

The major goals of NRHM include reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR); universal access to public health services, such as women's health, child health, water, sanitation and hygiene, immunisation and nutrition; prevention and control of communicable and non-communicable diseases, including locally endemic diseases; access to integrated comprehensive primary healthcare, population stabilization, gender and demographic balance and revitalizing local health traditions and mainstreaming AYUSH and promotion of healthy life styles based on scientific principles.

The Plan of Action of this Mission has ten components that include creation of accredited social health activists; strengthening Sub Centres, Primary Health Centres (PHC) and Community Health Centres (CHCs) for first

referral care; creating district health plan covering sanitation and hygiene; strengthening disease control programmes; supporting Public-Private Partnership for public health goals including regulation of Private Sector; formulation of new health financing mechanisms and reorienting health/medical education to support rural health issues. The mission envisages the following roles for Panchayati Raj Institutions.

- States to indicate in their Memorandum of Understanding (MoUs) the commitment for devolution of funds, functionaries and programmes for health to Panchayati Raj Institutions.
- The District Health Mission (DHM) to be led by the *Zila Parishad*. The DHM will control, guide and manage all public health institutions in the district Sub Centres, Primary Health Centres and Community Health Centres.
- Accredited Social Health Activist (ASHAs) would be selected by and be accountable to the village *Panchayat*.
- The Village Health Committee (VHC) of the *Panchayat* would prepare the Village Health Plan (VHP), and promote inter-sectoral integration.
- Each Sub Centre will have an 'Untied Fund' for local action @ Rs. 10,000 per annum. This fund will be deposited in a joint bank account of the Auxiliary Nurse Midwife and Anganwadi Workers (ANM) and *Sarpanch* and operated by the Auxiliary Nurse Midwife, in consultation with the Village Health Committee.
- PRI involvement in *Rogi Kalyan Samitis* for good hospital management.
- Provision of training to members of PRIs.
- Making health related databases available to all stakeholders, including *Panchayats* at all levels.
- HIV testing and counseling facilities.

National Urban Sanitation Policy: The National Urban Sanitation Policy urges States to come up with their own detailed State-level urban sanitation strategies and city sanitation plans. It moots the idea of totally sanitized cities and the setting up of a multi-stakeholder city sanitation task force to achieve it. Environmental considerations, public health implications and reaching the unserved and urban poor are given significant emphasis in the Policy. However, Himachal Pradesh doesn't have detailed State-level urban sanitation strategies and city sanitation plans except for the City Development Plan (which inter alia covers sewage sector) for Shimla under the JNNURM initiative administered by the Municipal Corporation of Shimla.

The vision for urban sanitation in India- as per the National Urban Sanitation Policy is: All Indian cities and towns to become totally sanitised, healthy, livable and ensure to sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women. As per the key sanitation policy issues highlighted in National Urban Sanitation Policy, the following key policy issues must be addressed.

- **Poor Awareness**: Sanitation has been accorded low priority and there is poor awareness about its inherent linkages with public health.
- **Social and Occupational Aspects of Sanitation**: Despite appropriate legal framework, progress towards the elimination of manual scavenging has shown limited success. Little or no attention has been paid towards the occupational hazards faced by sanitation workers involved in manual scavenging.
- **Fragmented Institutional Roles and Responsibilities**: There are considerable gaps and overlaps in institutional roles and responsibilities at the national, State, and city levels.
- **Lack of an Integrated City-wide Approach:** sanitation investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal.

National Policy on Safety, Health and Environment at Work–place, 2010: The major objectives of this Policy are continuous reduction in the incidence of work related injuries, fatalities, diseases, disasters and loss of national assets by effectively enforcing all applicable laws and regulations concerning safety, health and environment at work places.

Environment (Protection) Act, 1986: This is the most significant and diversified national level Act to safeguard the natural environment. Para 2 of introduction of the Act states that it is an act to provide for the protection and improvement of human environment and the prevention of hazards to human beings, other living creatures, plants and property. Item 2, Chapter 1 of the Act states that 'environment' includes water, air, land and the inter-relationship, which exists among and between water, air, land and human beings, other living creatures, plants, micro-organism and property. 'Environmental Pollutant' means any solid, liquid or gaseous substance present in such concentrations as may be or tend to be injurious to environment. "Environmental Pollution means the presence in the environment of any Environmental Pollutant". It is an umbrella Act, which has several rules under it to address different problems related to environment and pollution control.

Bio-Medical Waste (Management and Handling) Rules, 1998 (As amended in 2003): These rules apply to all, who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining to or in production or testing of biologicals. Section 4 of these rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.

Guidelines on Mercury-Contaminated Wastes, Central Pollution Control Board: Central Pollution Control Board has recognised that there is a possibility of waste containing mercury and its compounds to be above the permissible limit in terms of the concentration, and hence has to be regarded as hazardous. In November 2005, Central Pollution Control Board wrote to all State Pollution Control Boards to make the segregation of mercury-contaminated waste materials a condition for granting authorization to the healthcare facilities. Central Pollution Control Board also notes that new healthcare establishments will have to ensure that mercury-laden waste is properly segregated, treated and disposed.

CPCB Guidelines for Bio-Medical Waste Incinerators: Central Pollution Control Board Guidelines for bio-medical waste incinerators include requirements for the incinerator design and its air pollution control device, physical structures (incineration and waste storage rooms), operator qualifications, personal protection equipments, and emergency procedures.

CPCB Manual on Hospital Waste Management, 2000: Central Pollution Control Board brought out this technical guidance document in the areas of bio-medical waste segregation, storage, transport and treatment. The Central Pollution Control Board manual gave special emphasis to incineration, covering incinerator emissions, maintenance requirements, operational problems and solutions, and pollution control systems.

Guidelines on Auto Disable Syringes, Central Pollution Control Board: Studies on injection safety has revealed that a significant number of injections used in immunisation are unsafe. The Government of India (GoI) decided to introduce Auto Disable (AD) syringes instead of glass or disposable syringes to minimise the risk of infections through reuse of inadequately sterilised and/or infected syringes. However, the use of Auto Disable syringes will generate relatively large quantities of plastic bio-medical waste, which need to be disposed in an environmentally sound manner.

This guidance document is provided by CPCB in its Guidelines on Auto Disable syringes. This is similar (not contrasting) in content with the 'Guidelines on Universal Immunisation Programme'. The salient features of these guidelines are captured in the 'Operational Framework' included in this document.

Guidelines on Central Waste Treatment Facilities, CPCB: CPCB Guidelines on Central Bio-Medical Waste Treatment Facilities sets out requirements for the location, land size, coverage area (maximum number of beds), treatment equipment and infrastructure setup of the Central Waste Treatment Facilities, collection and transportation of bio-medical waste and disposal of treated bio-medical waste and other operational issues.

Operational Guidelines on Infection Management and Environment Plan (IMEP), Minstry of Health & Family Welfare: Bio-medical waste consists of a small percentage of infectious and/or hazardous waste. These include infected sharps and wastes with infectious, hazardous, radioactive, or genotoxic characteristics, which, if inadequately treated and managed, can have adverse impact on the environment and on public health through air, land and water pollution. Therefore, institutionalizing effective waste management systems in all healthcare facilities is a key prerequisite to improving efficiency and effectiveness of healthcare. A set of 'Operational Guidelines', which are designed as instruction manuals for healthcare workers at primary level healthcare facilities i.e. Community Health Centres, Primary Health Centres and Sub Centres have been prepared to be used. These guidelines are in the form of simple pictorial presentations of various steps needed to manage infectious waste in a hygienic, safe and environmentally sound manner. The IMEP guidelines will be implemented and monitored under the auspices of the National Rural Health Mission (NRHM) and will go a long way to internalise state–of–the art, best practices in managing health and environment risks in the healthcare institutions of our country.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 of these rules defines disposal of Municipal Solid Wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal Solid Wastes from place to place hygienically through specially designed transport systems so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of Municipal solid wastes.

The Air (Prevention and Control of Pollution) Act, 1981(As amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid a gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

The Water (Prevention and Control of Pollution) Act, 1974(As amended in 1988): This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent orany other liquid, gaseous and solid substance into water (whether directly or indirectly) as the case may be, or is likely to create nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or aquatic organisms.

The Factory Act, 1948: This Act is a major legal instrument to ensure safety, health and environment at work place. Chapter III of the Act addresses health issues at work place. Chapter IV describes issues related to safety.

Chapter IVA of the Act describes provisions relating to hazardous processes.

Employees State Insurance Act, 1948: An Act to provide for certain benefits to employees in case of sickness, maternity and employment injury and to provide for certain other matters in relation thereto. Under this Act, the ESI scheme is applicable in the areas of Solan, Parwanoo, Barotiwala, Baddi, Kala-Amb, Mandi, Una and Shimla town.

Guidelines for Universal Immunisation Programme, Minstry of Health & Family Welfare (MoHFW), Government of India (GoI): India's Universal Immunisation Programme (UIP) is one of the largest health programmes in the world for giving vaccinations to children and women. Most vaccines are given by injection. The programme includes administration of about 200 million injections each year covering about 5.5 lakhs sites in the various urban as well as rural areas including remote/out of reach locations of India. The vaccination practice of the UIP, so far, involved the use of either glass or disposable syringes. Such waste generated in rural areas, particularly at out of reach points, is a matter of concern. CPCB has prepared guidelines for disposal of Biomedical Wastes that will be generated in the UIP process. The salient features of these guidelines are captured in the Operational Framework included in this document.

Various Tool Kits consisting of community monitoring tools and checklist and report card formats for health assessment are available at the website, www.mohfw.nic.in/nrhm.htm. Some of them are Community Health Centre (CHC) facility checklist, Community Health Centre (CHC) report card, district level cumulative Community Health Centre (CHC) report card, district level cumulativePrimary Health Centre (PHC) report card, block level cumulative Primary Health Centre (PHC) report card, cumulative Sub Centre report card, block level cumulative Sub Centre report card, district level cumulative Sub Centre report card, cumulative village report card, block level cumulative village report card, district level cumulative village report card, guidance for group discussion with community, guidance for group discussion with marginalised women, guidance for group discussion with women, maternal health beneficiary interview, Medical Officer (MO) Interview, PHC facility checklist, PHC level report card, Sub Centre facility checklist, Sub Centre report card, Village level report card etc.

Ministry of Health & Family Welfare, Government of India Guidelines: Under NRHM, these guidelines have been formulated for Sub Centres, PHC/CHC, 31-50 bedded Hospital, 51-100 bedded hospital, 101-200 bedded hospital, 201-300 bedded hospital and 301-500 bedded hospital. These are available on the above mentioned website. Further, facility survey formats under Indian Public Health Standards (IPHS) for monitoring the Sub Centres, PHC/CHC, 31-50 bedded hospital, 51-100 bedded hospital, 101-200 bedded hospital, 201-300 bedded hospital and 301-500 bedded hospital are also available on the website.

Other Ministry of Health & Family Welfare, Government of India Guidelines: These include guidelines on integrated management of neonatal and childhood illnesses; guidelines for Village Health and Sanitation Committees, Sub Centre (SC), Community Health Centres (CHCs), Primary Health Centres (PHCs), which include guidelines regarding the constitution of Village Health and Sanitation Committees and utilisation of 'Untied Grants' to these Committees; guidelines for the use of Sub Centre (SC) funds under NRHM; guidelines for the utilisation of 'Untied Fund' and, annual maintenance grant for Primary Health Centres; suggested guidelines for the implementation of Indian Public Health Standards in Sub Centres, Primary Health Centres and Community Health Centres. These are available on the website. These guidelines also include broad framework for the preparation of District Health Action Plans; guidelines for the constitution of *Rogi Kalyan Samiti*

(RKS)/Hospital Management Societies; framework for developing health insurance programmes; guidelines for Department of Health and Family Welfare supported NGO Schemes.

Ministry of Health & Family Welfare, Government of India Guidelines for Conducting Health Melas (Fair): As part of the National Population Policy (NPP), in February 2000, one of the schemes taken up was on advocacy and holding seminars and *melas* (fairs) all over the country, particularly in the demographically weaker areas. These melas, popularly known as '*Parivar Kalyan Avam Swasthya Melas*', aim at providing quality services with converging and integrated delivery of services for all segments of population. People become aware of a number of options available to them in terms of different systems of medicine (allopathy, homeopathy, ayurveda and unani etc.). They also begin to comprehend the linkages between preventive, promotive, curative and rehabilitative health care as well as between the Primary, Secondary, and Tertiary health sectors. They get sensitised about the roles of Central Government, State Government, elected local bodies, NGOs and professional organisations.

Ministry of Health & Family Welfare, Government of India Guidelines for the Operationalisation of Mobile Medical Unit (in North-eastern States, Himachal Pradesh and J&K): Many areas in the country, predominantly tribal and hilly areas, even in well-developed States, lack basic health care infrastructure, thereby limiting access to health services at present. Over the years, various initiatives have been taken to overcome this difficulty with varied results. Many States/NGOs have successfully tried out operationalising Mobile Medical Units. Under the NRHM, provision of Mobile Medical Unit (MMU) in each district is one of the strategies to improve access to health care. For North Eastern States, Himachal Pradesh and J&K, due to their difficult hilly terrain, non-approachability by public transport and long distances for reaching the health centres necessitate the need of MMU with specialised facilities for the patients requiring basic specialist examination. Every Mobile Medical Unit has to provide the services including curative referral of complicated cases; early detection of TB, Malaria, Leprosy, Kala-Azar and other local endemic and communicable diseases and non-communicable diseases such as hypertension, diabetes and cataract cases etc.; minor surgical procedures and suturing; specialist services, such as Obstetrics & Gynaecology specialist, pediatrician and physician, reproductive and child health services, family planning services, diagnostic and specialised facilities and services consisting of ECG, X-ray and other scanning services.

The National Water Policy, 2002: This national level Policy addresses the water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. The Policy states about the consumptive use of water, water conservation and quantification of water pollution.

The National Environment Policy, 2005: This national level Policy deals mostly with the issues related to the control and regulation of environmental degradation. The Policy underlines the need for water conservation and appropriate management. It also states the importance of integrated water resource management.

State Level Policies /Regulations

Health Vision, 2008: The Health Vision, 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for attainment of targets. The primary goal of Vision 2008 is to achieve the status – Health for All. It strives for clearing the path and removing the hurdles for better health status of the people, thereby leading towards improvement in the quality of their lives with main emphasis on equity and access. The defining goal of the vision is to improve the

health of the people of Himachal Pradesh. It stresses upon efforts to reduce premature mortality at all stages of the life cycle and reduction of non-fatal health outcomes as key components.

- The Vision 2008 Roadmap aims to provide the people of the State with equal and increased distribution of primary health care services; rationalise the distribution of manpower to increase the utilisation and access of services; increase the number of specialists in the State to take care of complicated cases and provide specialised services; continuous training of health personnel to meet the new emerging challenges and increase patient satisfaction; synergies efforts with indigenous system of medicine; increase the outreach and extension of services; and increase the involvement of community and NGO participation.
- Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen the existing system to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.
- In order to implement this vision, the State will focus on strengthening of infrastructure and service delivery to provide the basic care at village level, improve facilities and services in CHCs and regional hospitals and provide the best available specialised care through medical colleges.

Notification No. Health A-B (12)/1/2002: It notifies the creation and establishment of a new Directorate of Health Safety and Regulation. Directorate of Health Safety and Regulation shall deal with subjects related to Environment (Protection) Act, 1986; Bio-medical Waste (Management and Handling) Rules, 1998; Himachal Pradesh Clinical Establishment Registration Act, 2007, Drugs and Cosmetic Act, 1940 and Rules, 1945; Prevention of Food Adulteration Act, 1954 and Rules, 1955 and Food Safety Standard Act, 2006 (Act No. 34 of 2006); Atomic Energy Act, 1962 and Radiation Protection Rules, 1971; besides Empanelment of Private Health Institutions, Composite Testing Laboratory Kandaghat and Employees State Insurance Services.

Notification No. HFW-B (F) 7-2/2001 Dated 10.12.2001 of Department of Medical Education, Department of Health and Family Welfare, Government of Himachal Pradesh and Orders of the Commissioner-cum-Secretary (Health) to the Government of Himachal Pradesh. This notification directs establishment of health and family welfare advisory committees known as *Parivar Kalyan Salahkar Samiti* (PARIKAS) at the *Panchayat*, block and district levels for the involvement of the PRIs.

The Himachal Pradesh Vaccination Act, 1968 (Act No. 17 of 1969): This Act is an attempt to consolidate and amend the law relating to the prohibition of inoculation and to make primary vaccination and re-vaccination of children compulsory throughout Himachal Pradesh.

The Himachal Pradesh Medical Council Act, 2003 (Act No. 16 of 2003): Its objective is to provide for the constitution of Himachal Pradesh Medical Council and the maintenance of a register of medical practitioners, who are engaged in the practice of modern scientific system of medicine and all its branches in the State of Himachal Pradesh and for matters connected therewith.

Notification No. HFW-H (RSBY) 2/08-Part: It notifies the establishment of a separate Society under the Societies Registration Act, 2006, which will work as Nodal Agency for the implementation of the '*Rashtriya Swasthya Bima Yojna*' for BPL families in the Department of Health and Family Welfare, Himachal Pradesh.

Following are Some Related Plans and Programmes being Implemented in the State:

Establishment of *Parivar Kalyan Salahkar Samiti* (PARIKAS): Himachal Pradesh has set up health and family welfare advisory committees known as *Parivar Kalyan Salahkar Samiti* (PARIKAS) at the *Panchayat*, block and district levels for the involvement of the PRIs. The functions of the *Panchayat* PARIKAS include supervision and monitoring; implementation of national health programmes; ensuring cleanliness of the villages; checking pollution of water, air and noise; making people aware of dog and snake bites and their first aid treatment; cleaning and using bleaching powder etc., for traditional water sources; disseminating information about Reproductive and Child Health (RCH) care; checking regular opening of Sub Centres and ensuring that immunisation and other necessary facilities are being provided to the newborn by the health functionaries; helping in updating the records of births, deaths and marriages; and preparing micro health plans every year.

The functions of the block and district PARIKAS are to provide effective leadership and able guidance; hold periodic inspection of health institutions through sub-committees (with each sub-committee having an elected representative and a medical officer nominated by PARIKAS); appropriate counselling, whenever required; and disseminating Information, Education and Communication (IEC). It is also envisaged that the PARIKAS at the three levels will be broad based and shall function as inter-departmental co-ordination committees.

National Vector Borne Disease Control Programme (NVDCP): This programme mainly controls malaria in the State. Though the State is low endemic for malaria, however, laboratory technicians and surveillance workers are deployed in malaria endemic districts under this programme.

Revised National Tuberculosis Control Programme (RNTCP): Its a National run Tuberculosis control initiatives, which incorporate the principles of Directly Observed Treatment Short-course (DOTS) for the control and eradication of Tuberculosis. The programme provides free of cost, quality anti-tubercular drugs across the country through numerous PHCs and growing number of Private Sector DOTS providers.

Sewerage development plan is being administered by the Urban Development Department instead of Irrigation and Public Health (I&PH) Department w.e.f. 1.4.2008. Hence, the previous programme under this head and activities prepared for the annual plan 2008-09 are for 56 towns in Himachal Pradesh, out of which 49 towns are under Irrigation & Public Health (I&PH) Department. Six towns (Yol, Bakloh, Kasauli, Sabhatu, Dagshai and Dalhousie Cantonment) are under Cantonment Boards and Parwanoo is under Housing Board.

Sewerage schemes for 13 towns namely, Sh. Naina Deviji, Chamba, Mandi, Bilaspur, Palampur, Rohroo, Shimla, Manali, Ghumarwin, Jawalamukhi, Arki, Jogindernagar and Rampur, two rural/tribal schemes Sarahan and Reckong Peo, respectively have been completed up to 31st March, 2007.
In addition, other plans/schemes, like integrated low sanitation scheme, State sanitation strategies consisting of schemes for Urban Poor and City Sanitation Task Force and Total Sanitation Campaign, Environmental Improvement of Urban Slums (EIUS) are being implemented at the State level. These schemes have been briefly described in the guidelines for sanitation.

Rural and urban water supply plans under eleventh five year plan (2007-12), Accelerated Rural Water Supply Programme (ARWSP), Rajiv Gandhi National Drinking Water Mission (RGNDWM) and Prime Minister's *Gramodaya Yojona* – Rural Drinking Water, desilting of water bodies and water conservation works under National Rural Employment Guarantee Scheme are major plans/programmes to provide access to potable drinking water in the State.

***Mahila Gram Panchayat Swasthya Sahayika* Scheme (MGPSS) 2009:** The main objective of this scheme is to promote the role of *Gram Panchayat* in providing basic health care to their resident. These include preventive, promotive and curative health services including antenatal/natal care, Reproductive and Child Health, sanitation and nutrition.

Nutritional Programme for Adolescent Girls (NPAG): This programme is implemented on pilot basis in urban slums. Under this scheme, *Anganwadi* workers weigh all adolescent girls (11-19 years) in the community four times in a year and based on these observations, food grains are distributed to those undernourished adolescent girls having body weight of less than 35 kg.

World Bank Aided Hydrology Project-II: This project is being implemented by Central Water Commission, Himachal Pradesh under which water quality labs levels II and III are under process of establishment in different River basins in the State.

2.4 Road & Transport

The policies and laws applicable and/or related to road sector and road infrastructure development of the State of Himachal Pradesh are listed below along with a brief description of their relevance. Detailed explanations can be acquired from the websites of relevant Departments and Ministries, like the Ministry of Environment and Forests (MoEF) (www.envfor.nic.in), Ministry of Road, Transport and Highways, Government of India (www.morth.nic.in) and Government of Himachal Pradesh (www.himachal.nic.in).

National Level Policies / Regulations

National Road Transport Policy: It includes formulation/implementation of policies for road transport, development and maintenance of National Highways and transport research to lay stress on increased and safe mobility of the road transport system in the country.

National Urban Transport Policy: India's urban population is currently around 30 percent of its total population. Experience across the world has been that as economies grow, rapid urbanisation takes this proportion to over 60 percent before it begins to stabilise. For urban areas to be able to support the required level of economic activities, they must provide for easy and sustainable flow of goods and people. Some of the constraints in urban environment, which the urban population faces, include accessing jobs, education, recreation and similar activities. The cost of travel, especially for the poor, has increased considerably. This is largely because the use of cheaper non-motorised modes like cycling and walking has become extremely risky, since these modes have to share the same right of way as the motorised modes. The vision of the policy include: to recognise that people occupy center-stage in our cities and all plans would be for their common benefit and well being; to make our cities the most livable in the world and enable them to become the 'engines of economic growth' that power India's development in the 21st century; to allow our cities to evolve into an urban form that is best suited to the unique geography of their locations and is best placed to support the main social and economic activities that take place in the city.

The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities. This is sought to be achieved by: incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement; encouraging integrated land use and transport planning in all cities, so that travel distances are minimised and access to livelihoods, education, and other social needs, especially for the marginal segments of the urban population, is improved; improving access of business to markets and various factors of production; bringing about a more equitable allocation of road space with people rather than vehicles as its main

focus; encourage greater use of public transport and non-motorised modes by offering Central financial assistance for this purpose; enabling the establishment of quality focused, multi-modal public transport systems that are well integrated and provide seamless travel across modes; establishing effective regulatory and enforcement mechanisms that allow a level playing field for all transport service operators and enhanced safety for the transport system users; establishing institutional mechanisms for enhanced coordination in the planning and management of transport systems; introducing Intelligent Transport Systems for traffic management; addressing the concerns of road safety and trauma response; reducing pollution levels through changes in traveling practices, better enforcement, strict norms, technological improvements etc.

Although the responsibility for management of urban areas (and thus urban transport) rests with the State Governments, a Central policy is considered necessary as: several key agencies that would play an important role in urban transport planning work under the Central Government with no accountability to the State Government; several Acts and Rules, which have important implications in dealing with urban transport issues, are administered by the Central Government; there is a need to guide State level action plans within an overall framework; the launching of the National Urban Renewal Mission (NURM) has provided a timely platform for providing significant financial support from the Central Government for investments in urban transport infrastructure. There is a need to build capacity for urban transport planning as well as develop it as a professional practice through coordinated capacity building, research and information dissemination to raise the overall level of awareness and skills.

The objectives of this Policy would be achieved through a multi-pronged approach that would revolve around a number of measures. These include: integrating land use and transport planning; equitable allocation of road space; priority to the use of public transport; quality and pricing of public transport; technologies for public transport; integrated public transport systems; priority to non-motorised transport; parking; freight traffic; use of cleaner technologies; innovative financing mechanisms using land as a resource; association of the Private Sector. In order to effectively promote such investments, the Central Government would: Provide 50 percent of the cost of preparing comprehensive city transport plans and detailed project reports; offer equity participation and/or viability gap funding to the extent of 20 percent of the capital cost of public transport systems; offer 50 percent of the cost of project development, whenever such projects are sought to be taken up through PublicPrivate Partnerships (PPP), so that a sound basis for attracting private partners can be established. The remaining cost of such project development would have to come from the City Development Authority/State Government and a project developer.

The Central Government would encourage high capacity public transport systems being set up through the mechanism of Special Purpose Vehicles (SPV) and would offer financial support either in the form of equity or one time viability gap financing, subject to a ceiling of 20 percent of the capital cost of the project, after evaluating various parameters, such as: extent of resources mobilised by the State Government through exploitation of its land resources; extent of resources likely to be generated from private participation; institutional mechanisms set up by the State Government to ensure a well-coordinated public transport system; willingness to divert funds from projects that add to road capacity towards public transit systems; initiatives taken to promote non-motorised transport and improve safe access to public transport; willingness to introduce premium public transport systems that are priced high, but offer better quality with a view to limit the subsidy requirements in normal services; willingness to involve the Private Sector in operations under the overall supervision and

coordination of a public agency; willingness to price public transport systems in such a manner that they become financially sustainable at the operating stage or depend only marginally on public budgets.

Urban Reforms: The India Infrastructure Report, 1996, assessed the total annual investment needs of water supply, sanitation and road sectors at Rs. 28,036 *crores* per year on an average during 1996-2006. But, funds to that extent are not available.

To overcome these constraints and challenges, the Ministry of Urban Development has initiated institutional, fiscal and financial reforms. The first generation urban sector reform - known as the 74th Constitutional Amendment Act of 1992, recognises the principles of Local Self Governments and empowers Urban Local Bodies with financial resources through Central Finance Commission and State Finance Commissions. Subsequently, in order to strengthen these local bodies, second generation reforms have also been started. In the last decade, enormous progress has been made in removing impediments to efficient investments.

National Auto Fuel Policy, 2003: Broadly, the policy gives a roadmap for achieving various vehicular emission norms over a period of time and the corresponding fuel quality upgradation requirements. It does not recommend any particular fuel or technology for achieving the desired emission norms. It suggests that, taking into account security of supplies and existing logistics perspectives, liquid fuels should remain as main auto fuels throughout the country and that the use of Compressed Natural Gas / Liquified Petrolium Gas be encouraged in cities affected by higher pollution levels, so as to enable vehicle owners to have the choice of the fuel and technology combination. The report also recommends measures for improving the present mechanism of checking pollution from in-use vehicles.

Salient features of proposed auto fuel policy include:

Vehicular Emission Norms: - A road map for vehicular emission norms for new vehicles would be as follows:

Coverage	Passenger cars, light commercial vehicles & heavy duty diesel vehicles	2/3 wheelers
Entire country	Bharat Stage II - 1.4.2005 Euro III equivalent – 1.4.2010	Bharat Stage II – 1.4.2005 Bharat Stage III* – Preferably from 1.4.2008, but not later than 1.4.2010
11 major cities (Delhi/NCR, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmedabad, Pune, Surat, Kanpur & Agra)	Bharat Stage II - 1.4.2003 Euro III equivalent – 1.4.2005 Euro IV equivalent* – 1.4.2010	

* *These schedules would be reviewed in the year 2006, when Euro-II equivalent norms would be implemented in the entire country and Euro-III equivalent norms would be implemented in 11 major cities.*

It can be observed that the cities facing serious pollution levels have been brought under a separate road map for quicker adoption of emission norms.

Auto Fuels: The twin objectives of providing assured supply of auto fuels and meeting environmental concerns would be achieved by: a) Liquid fuels would be the main auto fuels throughout the country by progressively upgrading the quality/specifications in line with vehicular emission norms; b) The use of CNG/LPG would be encouraged in the cities affected by high vehicular pollution to enable the vehicle owners to have the choice of fuel and technology combination to meet the higher emission norms in such cities; c) To accelerate the development of other alternative fuel vehicles including battery powered vehicles, hydrogen and fuel cell vehicles, a comprehensive programme of policy support,

R&D support and other measures for zero emission vehicles would be drawn up; d) Technologies for producing ethanol/bio-fuels from different renewable energy sources and vehicles to utilise these bio-fuels would be encouraged by providing R&D and other support through fiscal and financial measures.

Reduction of Pollution from In-use Vehicles: For reduction of pollution from in-use vehicles, the following measures are suggested: a) New improved Pollution Under Control (PUC) checking system for vehicles; b) Inspection and maintenance (I&M) system for vehicles; c) Performance checking system of catalytic converter and conversion kits for CNG/LPG; d) Augmentation of city public transport system; e) Compliance of emission norms by city public service vehicles and inter State vehicles.

Road Map for Compliance of Emission Norms: After 1.4.2007, inter-State buses/trucks would not be allowed to originate/or terminate in Delhi, unless they meet minimum of India 2000 emission norms. The cut off point for meeting Bharat Stage II norms will be 1.4.2011; in respect of 10 other major cities, all inter-State buses will have to meet w.e.f 1.4.2006 a minimum of 1996 emission norms in case they were registered before 1.4.2000. They have to meet w.e.f 1.4.2008, a minimum of India 2000 norms if they were registered after 1.4.2000; in respect of 10 other major cities, all inter-State buses would need to meet a minimum of Bharat Stage-II emission norms w.e.f. 1.4.2011, if these vehicles are registered after 1.4.2005.

National Policy on Resettlement and Rehabilitation, 2007: The provisions of the National R&R Policy, 2007 provide for the basic minimum requirements, and all projects leading to involuntary displacement of people must address the rehabilitation and resettlement issues comprehensively. The State Governments, Public Sector Undertakings or agencies, and other Requiring Bodies shall be at liberty to put in place greater benefit levels than those prescribed in the National Rehabilitation & Resettlement Policy -2007.

The Policy addresses the need to provide succour to the asset-less rural poor; and support the rehabilitation efforts of the resource poor sections, namely small and marginal farmers, SCs/STs and women, who have been displaced. Besides, it seeks to provide a broad canvas for an effective dialogue between the Project Affected Families (PFAs) and the Administration for Resettlement and Rehabilitation (R&R) to enable timely completion of project with a sense of definiteness with regard to costs and adequate attention to the needs of the displaced persons. The objectives of the policy are to: minimise displacement; plan the Relief & Rehabilitation of Project Affected Families including special needs of tribals and vulnerable sections; provide better standard of living to Project Affected Families and facilitate harmonious relationship between the Requiring Body and Project Affected Families through mutual cooperation.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a Green India, (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

Notification on Protection and Improvement of Quality of Environment in the Himalayas, 2001: This notification was issued by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986, specifically for environmental

protection in the Himalayan States. The activities relate to location planning in urban areas, rainwater harvesting and guidelines for the construction of hill roads.

The Control of National Highways (Land and Traffic) Act, 2002: This is an Act to provide for control of land within the National Highways, right of way and traffic moving on the National Highways and also for removal of unauthorised occupation thereon.

Highway Land to be Deemed as Property of Central Government: All land forming part of a Highway, which vest in the Central Government or which do not already vest in the Central Government but have been acquired for the purpose of Highway, shall, for the purposes of this Act and other Central Act, be deemed to be the property of the Central Government as owner thereof.

Prevention of Occupation of Highway Land: No person shall occupy any Highway land or discharge any material through drain on such land without obtaining prior permission for such purpose in writing from the Highway Administration or any officer authorised by such Administration on this behalf. The Highway Administration or the officer authorised under Sub-section (1) may, on an application made by a person in this behalf and having regard to the safety and convenience of traffic, grant permission to such person to: i) place a movable structure on the Highway in front of any building owned by him or to make a movable structure on support of such building and over the Highway; or ii) put up a temporary awning or tent or other similar construction or a temporary stall or scaffolding on the Highway; or iii) deposit or cause to be deposited, building materials, goods, for sale or other articles on any Highway; or iv) make a temporary excavation for carrying out any repairs or improvements to adjoining buildings.

The Highway Administration or the officer authorised by such Administration on this behalf shall have power without issuing any notice under this section to remove the unauthorised occupation on the Highway land, if such unauthorised occupation is in the nature of: (*a*) exposing any goods or article: *i*) in open air; or *ii*) through temporary stall, kiosk, booth or any other shop of temporary nature; (*b*) construction or creation, whether temporary or permanent; or (*c*) trespass or other unauthorised occupation, which can be removed easily without use of any machine or other device, and in removing such occupation, the Highway Administration or such officer may take assistance of the police, if necessary, to remove such occupation by use of the reasonable force necessary for such removal.

If any time the Highway Administration is satisfied on the information received by it or otherwise that any Highway within its jurisdiction or any part thereof is or has become congested or unsafe for vehicular or pedestrian traffic by reason of damage or otherwise, it may either close the Highway or such part thereof to all traffic or to any class of traffic, or regulate the number and speed of vehicles to be used on the Highway or such part thereof, as the case may be, in the manner as it may deem fit.

No person other than a Highway Administration or a person authorised by such Administration on this behalf shall construct, install, shift, repair, alter or carry any poles, pillars, advertisement towers, transformers, cable wire, pipe, drain, sewer, canal, railway line, tramway, telephone boxes, repeater station, street, path or passage of any kind on highway land or across, under or over any highway except with the prior permission in writing from the Highway Administration for such purpose.

Public Private Partnership (PPP): All the future works of National Highway Development Program are to be taken up mainly on BOT (toll/annuity) basis; implementation of four laning of 4000 km of NHs under National Highway Development Program Phase IIIA on BOT (Toll) basis has been approved out of which 30 kms has been completed. Works on 1090 kms have been

awarded. Preparation of DPR in 7,113 kms under National Highway Development Program Phase IIIB has been approved; implementation of six laning of 6,500 kms of National Highways (5,700 kms under Golden Quadrilateral + 800 kms other reaches) under National Highway Development Program Phase-V on BOT (Toll) following Design Build Finance & Operate (DBFO) pattern has been approved at a cost of Rs. 41,210 *crores* by the Government on 5th October 2006. Six laning of 148 kms has already been awarded.

The Carriage by Road Act, 2007: This is an act to provide for the regulation of common carriers, limiting their liability and declaration of value of goods delivered to them to determine their liability for loss of, or damage to, such goods occasioned by the negligence or criminal acts of themselves, their servants or agents and for matters connected therewith or incidental thereto.

'Common Carrier' means a person engaged in the business of collecting, storing, forwarding or distributing goods to be carried by goods carriages under a good receipt or transporting for hire of goods from place to place by motorised transport on road, for all persons, indiscriminatingly, and includes a goods booking company contractor, agent, broker and courier agency engaged in the door-to-door transportation of documents, goods or articles utilising the services of a person, either directly or indirectly, to carry or accompany such documents, goods or articles, but does not include the Government.

As per this Act, no goods of dangerous or hazardous nature to human life shall be carried by a Common Carrier except in accordance with such procedure and after complying with such safeguards as may be prescribed. The Central Government may, by rules made on this behalf, specify the goods of dangerous or hazardous nature to human life and the label or class of labels to be carried in, or displayed on, the motor vehicle or such goods in the course of transportation. Notwithstanding anything contained in any other law for the time being in force, every Common Carrier shall scrutinise and ensure before starting transportation of any consignment that it is covered by, one or more insurance policies under a contract of insurance in respect of such goods providing relief in case of death or injury to a person or damage to any property or the consignment, if an accident takes place.

Land Acquisition Act, 1894 and1985 : This act sets out rule for acquisition of land by the Government.

The Central Road Fund (State Roads) Rules, 2007: These rules may be called the Central Road Fund (State Roads) Rules, 2007. These rules exist for the disbursement of the Central Road Fund in respect of specified projects, schemes and activities relating to development and maintenance of State roads including roads of inter-State connectivity and economic importance.

'Scheme' means the scheme for development of State roads including roads of inter-State connectivity and economic importance and includes the schemes relating to development of State roads sanctioned under the Central Road Fund by the resolution governing the Central Road Fund as passed by the Houses of Parliament, dated 13th May, 1988.

The types of works to be considered in this scheme shall comprise: (i) construction of missing bridges, cross drainage works, rehabilitation of bridges, widening of two-lanes, strengthening of weak pavement sections; (ii) engineering aspects of road safety works covering improvement of traffic junctions, road marking, signaling, construction of subways and over-bridges, construction of parking lay-byes, bus sheds and the like; (iii) construction of bypasses, parallel service roads along national highways or State highways, in built up areas in exceptional cases; and (iv) development of connecting roads to National Highways from rural roads as well as to places of tourist importance.

The Constitution (Seventh-Fourth Amendment) Act, 1992: This Act invests the

Municipalities with such powers and authority as may be necessary to enable them to function as institutions Self-Government and such law may contain provisions for the devolution of powers and responsibilities upon municipalities, subject to such conditions as may be specified therein, with respect to: (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and the implementation of schemes as may be entrusted to them including those in relation to the matters listed in the Twelfth Schedule; (b) the committees with such powers and authority as may be necessary to enable them to carry out the responsibilities conferred upon them including those in relation to the matters listed in the Twelfth Schedule.

'Twelfth Schedule' (Article 243W) consists of: 1. Urban planning including town planning; 2. Regulation of land-use and construction of buildings; 3. Planning for economic and social development; 4. Roads and bridges; 5. Water supply for domestic, industrial and commercial purposes; 6. Public health, sanitation conservancy and Solid Waste Management; 7. Fire services; 8. Urban forestry, protection of the environment and promotion of ecological aspects; 9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded; 10. Slum improvement and upgradation; 11. Urban poverty alleviation; 12. Provision of urban amenities and facilities, such as parks, gardens, playgrounds; 13. Promotion of cultural, educational and aesthetic aspects; 14. Burials and burial grounds; cremations, cremation grounds and electric crematoriums; 15. Cattle ponds; prevention of cruelty to animals; 16. Vital statistics including registration of births and deaths; 17. Public amenities including street lighting, parking lots, bus stops and public conveniences; 18. Regulation of slaughter houses and tanneries.

Motor Vehicles Act, 1988: Department of Road, Transport and Highways is responsible for the administration of the Motor Vehicles Act, 1988 which, inter-alia, lays down the principles and procedures as well as the Authorities responsible for issue of driving licences; issue of permits; grant of fitness certificates for the vehicles on roads; prescribing of emission and safety related norms for motor vehicles; norms for type approval in conformity of production of new motor vehicles; issues relating to compensation in case of motor vehicle accidents etc.

Environment (Protection) Act, 1986: It is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it, to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991, was enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve the environment, which includes *water*, air and land and the inter relationship which exists among and between water, air, land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O. 844 (E), [19/11/1986]. The power conferred by the Environment (Protection) Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; *Water Pollution*; and 2-T Oil.

The Forest (Conservation) Act, 1980: The Forest (Conservation) Act, 1980, as amended in 1988, checks the indiscriminate diversion of forest land for non-forest purposes. It primarily deals with discouraging the diversion of forest lands for non-forestry purpose. It

requires State Governments to acquire the approval of the Central Government before it denotifies any forest, leases forest land to a private person or corporation, or clears it, even for the purpose of reforestation.

Prior clearance of projects requiring diversion of forests for non- forest purpose is needed under the Forest (Conservation) Act, 1980. The State Government/Union Territories are required to submit formal proposals to the Central Government (Ministry of Environment and Forests) for diversion of forest land for non-forest purposes in the prescribed proforma along with details, such as flora, fauna, map of the area, compensatory afforestation proposed etc. Therefore, as far as possible, it emphasises on the selection of non-forest land for various projects.

As per the amended Forest (Conservation) Rules, 2004 in force now, the Regional Chief Conservator of Forests has the powers to decide proposals involving forest land upto five hectares. Proposals involving forest land between 5 - 20 hectares shall be processed by the Regional Chief Conservator in consultation with a State Advisory Group consisting of representatives of the concerned State Government. Proposals involving more than 20 hectares of forest land are required to be placed before the Advisory Committee constituted by the Ministry of Environment & Forest, Government of India.
Some important guidelines laid down in Forest (Conservation) Act, 1980 and Rules, 1981 for diversion of forest land for non-forest purposes as may be relevant for Himachal Pradesh are given below.

- These guidelines ensure that ecological considerations are in no way undermined while examining investment proposals. The State Government or the Union Territory administration concerned is required to envisage at the initial stage itself, the different likely impacts of the proposed project, starting with the proposed site. The guidelines specify certain criteria for the siting of an industry. It states that no projects should be in the vicinity of National Parks, Wildlife Sanctuaries and Core areas of the Biosphere Reserves. Further, the project needs to consider scenic landscapes, areas of geomorphological significance, unique and representative biomes and eco-systems, heritage sites/structures and areas of cultural heritage and importance. It also includes fragile eco-systems, such as mountains, areas rich in coral formations as well as desert, wetland, and riverine eco-systems; and areas rich in biological diversity, gene-pool and other natural resources.
- Monoculture and plantation of dominating and exotic species shall be discouraged without sufficient experimentation.
- Introduction of exotic species of plants and animals without adequate investigations are to be avoided.
- Wild varieties of animals and plant species are not to be disturbed.
- Besides forest lands, diversion of prime agricultural lands for non-forest purposes are also restricted.

Wildlife (Protection) Act, 1972: The Government of India enacted the Wild Life (Protection) Act, 1972 with the objective of effectively protecting the wild life and to control poaching, smuggling and illegal trade in wild life and its derivatives. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent. The Ministry of Environment and Forests has proposed further amendments in the law by introducing more rigid measures to strengthen the Act. The objective is to provide protection to the listed endangered flora and fauna and ecologically important protected areas.

The Act established Schedules of protected plant and animal species. Hunting or harvesting these species was largely outlawed. It has six Schedules, which give varying degrees of protection. Schedule I and part II of

Schedule II provide absolute protection and offences under these are prescribed the highest penalties. Species listed in Schedule IV are also protected, but the penalties are much lower. Enforcement authorities have the power to compound offences under this Schedule (i.e., they impose fines on the offenders). Penalties are prescribed in Section 51. Enforcement can be performed by agencies, such as the Forest Department, the Police, the Customs and the Central Bureau of Investigation (CBI). Charge sheets can be filed directly by the Forest Department.

Amendment in the Wildlife Protection Act was done in 1993 and 2002. Various rules under this Act include (1) Recognition of Zoo Rules, 2009; (2) S.O.1092(E), [22/9/2003] - The National Board for Wild Life Rules, 2003; (3) S.O.445(E), [18/4/2003] - The Declaration of Wild Life Stock Rules, 2003; (4) G.S.R.350(E), [18/4/1995] - The Wildlife (Specified Plant Stock Declaration) Central Rules, 1995; (5) G.S.R.349(E), [18/4/1995] - The Wildlife (Specified Plants - Conditions for Possession by Licensee) Rules, 1995; (6) G.S.R.348(E), [18/4/1995] - The Wildlife (Protection) Rules, 1995; (7) Recognition of Zoo Rules, 1992; (8) G.S.R.328(E), [13/4/1983] - The Wildlife (Protection) Licensing (Additional Matters for Consideration) Rules, 1983; (9) G.S.R.29(E), [25/1/1973] - The Wildlife (Stock Declaration) Central Rules, 1973; and (10) G.S.R.198(E), [9/4/1973] - The Wildlife (Transaction and Taxidermy) Rules, 1973.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal solid wastes in terms of specified measures to prevent contamination of groundwater, surface water and Ambient Air Quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of Municipal Solid Wastes.

Biological Diversity Act, 2002 and Biodiversity Rules, 2004: This Act primarily aims at giving effect to the provisions of the Convention on Biological Diversity (CBD), including regulating access to biological resources and associated traditional knowledge so as to ensure equitable sharing of benefits arising out of their use, in accordance with the provisions of Article 15 of the CBD. Biological Diversity Rules were notified in 2004.

Wildlife protection has been included in Article 51-A of the constitution of India, as a fundamental duty of citizens of the country. In pursuance of this constitutional directive, in 1983, the Government of India, through the National Wildlife Action Plan of the Ministry of Environment and Forest, laid down several sets of actions by which wildlife should be conserved. These are contained in the Prime Minister's statement to the Indian Board of Wildlife in 1982, which listed aims of wild life conservation as the following: there should be a network of protected areas to cover representative samples of all major wildlife eco-system and with adequate geographic distribution; degraded habitats in these protected areas should be restored to their national state; rehabilitation of endangered species including restoration to former habitat and pastures; development of adequate corridors for genetic continuity in production forests and pastures; development of appropriate management system for protected areas and long term conservation of wildlife based on the scientific principles of evolution of genetics.

Environment Impact Assessment (EIA) Notification, September 14, 2006: EIA notification makes an EIA clearance mandatory for national and State highways/roads under Category 7 (f) and for aerial ropeway under Category 7 (g). Category A will cover new National Highways and expansion of National Highways greater than 30 kms, involving additional right of way greater than 20 meters involving land acquisition and passing through more than one

State. Category B will cover new State Highways and expansion of National/State Highways greater than 30 kms involving additional right of way greater than 20 meters involving land acquisition.

The Air (Prevention and Control of Pollution) Act, 1981 (As amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

The Water (Prevention and Control of Pollution) Act, 1974 (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of this Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended in 1988, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on the use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act dealing with Prevention and Control of Water Pollution invests the State Government with the power to restrict the application of the Act to certain areas; obtain information; take sample of effluents and procedure to be followed; seek reports on the result of analysis on samples taken under section; power of entry and inspection; Prohibition on the use of stream or well for disposal of polluting matter etc; put restrictions on new outlets and new discharges; refuse or withdraw consent by the State Board; appeals; seek revisions; empower the State Board to carry out certain works; furnish information to State Board and other agencies in certain cases; take emergency measures in case of pollution of stream or well; empower the Board to make application to courts for restraining apprehended pollution of water in streams or wells; and invest with the power to give directions.

Noise Pollution (Regulation and Control) Rules, 2000 (as amended in 2009): These rules deals with noise pollution regulations and controls in all areas including sensitive, commercial, residential and industrial areas.

State Level Policies

Policy on Development of New Township, 2010: The aim of this Policy is to initiate planned and eco-friendly development of new townships in Himachal Pradesh, thereby ensuring better quality of life for its inhabitants. This policy, therefore, outlines the following norms and standards for new townships. These include the guidelines for developing a new township; guidelines for sale and purchase of property in new townships; and guidelines for maintenance of new townships. With this policy, the Himachal Pradesh Government invites Private Sector participation in development of new townships in Himachal Pradesh.

Suggested Norms and Standards for Roads and Streets: Single lane without kerbs 05.00 metres; double-lane without kerbs 08.80 metres; double-lane with kerbs 10.00 metres; 3-lane with/without kerbs 13.00/11.80 metres.

Parking Norms: One car parking space/garage for each dwelling unit should be provided in residential buildings. For institutional buildings, leaving one floor exclusively for vehicle parking will be compulsory.

Population density for the new townships is proposed to be 100 to 150 persons per hectare. Travelling time from nearest town to the new township should be at least one hour/20 Kms. The new town should be self sufficient in infrastructure and its area, ideally, should not be less than 40 hectares. Provision of facilities for additional floating population should be made.

Right of Way Policy-2002 (as amended in 2004): Any service providing agency, like the Department of Telecommunication, authorized and registered/licensed infrastructure providers, I&PH, HPSEB etc. are eligible to avail of the Right of Way facility/permission. The Engineer-in-Chief/Zonal Chief Engineers will provide broad guidelines for various options, depending upon topography and site conditions for availing of Right of Way facility, which are as under: a) trenchless technology where cutting of road pavement is avoided and work can be carried out by drilling hole beneath the road pavement; b) creation of appropriate engineering structures on hill side of the road or on the valley side of the road at reasonable levels, thereby avoiding digging of the road; c) providing structures/poles for overhead cables; and d) underground ducts.

The Executive Engineer will grant permission based on topography and site specific conditions within 15 days along with map after receipt of application and deposit of restoration/reinstatement charges. Restoration/reinstatement of the road damaged due to digging and other activities while laying cables/ducts or construction of structures while availing the Right of Way will be done by the Public Works Department/owner of the road. Realistic charges/rates for restoration/reinstatement work will be fixed by concerned Zonal Chief Engineers or by the Engineer-in-Chief from time to time.

Cables/ducts shall ordinarily be laid at the edge of the road or at the minimum distance of 15 meters from the central line of the road where road land is available. The top of the casing/conduct pipe of service lane shall be at least 1.2 meters below the surface of the road. The user Department/Agency shall ensure that the debris/waste materials, if any, shall be disposed off by them at their own cost, failing which the owner of the road will do so at the cost of the user agency. The digging of the trenches would be strictly regulated, so that cables are laid and trenches are filled up before the close of the work every day. Filling should be completed to the satisfaction of the Department. While carrying out digging work, necessary caution like barricading, traffic diversion signs, danger lighting etc. shall be provided by the user.

As per the site conditions, if private land has to be utilised or private structures are to be utilised, the user agency will be required to meet the cost of land acquisition/rentals etc. as the case may be. Shifting of existing facilities like telephone cables, electrical lines, electrical poles etc., wherever required, would be done in a time bound manner and at their own cost. All the user agencies will ensure that there is no hindrance to the free flow of traffic. All the service providing agencies would give at least 15 days' notice when they want to undertake major repairs/maintenance/provide additional installations. All the service providing agencies would be required to deposit funds in advance with the Public Works Department for restoration etc.

The validity of 'Right of Way' in respect of Telecommunication Department/licensee would be co-terminus with the validity of

license. In respect of Telecommunication Department, 'Right of Way' facility would be available to the existing and future licensees and they will have to bear the cost involved in the re-installation and restoration. The service providers would be liable to pay full compensation to the aggrieved owners for any damage sustained by them by reasons of the exercise of Right of Way facility. All the service providing agencies shall ensure that while laying their installations, they do not damage other utilities and would ensure security and safety of these installations.

The basic telecom service provider/licensee will provide to the State Government a bandwidth of 2 mbps at the District and State headquarter nodes. However, the necessary installation of electronic equipments etc. in the respective nodes would be done by the State Government itself. This free bandwidth facility provided by basic service licensee will not include video conferencing, international connectivity, creation of Internet Kiosks etc. from the infrastructure providers. The permission granted shall not, in any way, be deemed to confer to the licensee/service provider any ownership right or any interest in route/Highway land/property.

The Public Works Department would make provision of service lanes/underground ducts in all the roads to be constructed under various schemes/programmes and in improvement and widening work of existing/new National Highways as far as possible, particularly in urban centers. The cost of providing this facility would be recovered from the service providing agencies. Similarly, the Public Works Department, henceforth, would make a provision in all the bridges and culverts for the service lanes and would recover the cost from the service providing agencies.

Tele-communication Service infrastructure providers are responsible for digging of trenches to lay cable in the *kacha* and untarred portion of the road and filling of the same through appropriate compaction and restoration of roads. "The bank guarantee will be forfeited, if restoration reinstatement work of the roads' dug out portion and the damages caused or likely to cause to bituminous surface or *pucca* drainages due to such digging of trenches is not done as per the satisfaction of the officers of the Department."

Relaxation for BSNL in the Amendment of Right of Way Policy, 2004: Keeping in view the fact that the Optical Fiber Cable (OFC) networking in the tribal and remote areas of the State is non-remunerative and financially not viable and keeping in view the need of reliable communication in these areas, it is proposed to charge from BSNL reinstatement charges @ Rs.30,000/- per Km of route length, as is being charged by BRO, instead of taking performance bank guarantee; and reinstatement of road will be carried out by the HPPWD. The trenches will be dug on hill side on the extreme edge of the road, which is mostly *kacha* portion and reinstatement of trenches upto road level will be done by BSNL. Hence, irrespective of whether it is kacha or bituminous surface, a uniform rate of Rs. 30,000/- per of route length Km will be charged from BSNL as a special case in the tribal and backward blocks of the State.

The Himachal Pradesh Road Infrastructure Protection Act, 2002: This Act seeks to provide for prevention of misuse, damage, unauthorised use and encroachment of the road infrastructure.

No person shall: (i) encroach upon the Government land under road infrastructure; (ii) raise any permanent, temporary or movable structure on or from road infrastructure; (iii) misuse a road by erecting workshop and carrying out commercial activity including tethering of livestock on road infrastructure; (iv) block/damage roadside drains and cross drainage system; (v) divert sullage / muck from private properties to the road; (vi) stack/throw excavated earth / debris on roads and unauthorized stack materials on roads; (vii) dig/damage road infrastructure without permission from competent authority; (viii) unauthorisedly install hand pumps and petrol

pumps; (ix) damage / deface bridges, road over bridges, flyovers and under-passes including approaches, return walls and wing walls, parapets, railing and lighting system, protection works, tunnels and their ancillary structures and other structures, such as road pavement, shoulders, re taining walls, breast walls, toe walls, cross-drainage and roadside drains, road junctions, medians, speed-breakers, i/c rumble strips, street lighting, traffic lights, barricades, crash barriers, sign board, kilometer stone, reference pillar, boundary pillar, road identification marked infrastructure, pedestal benches, toll booths/plaza, way side amenities, such as rain shelters, lay byes, bus lanes, public conveniences, parks and open spaces along the road and building any other structure meant for facilitating road transportation and maintenance of roads; (x) park damaged or condemned or serviceable or unserviceable vehicles or goods/machinery on the road; xi) damage/uproot roadside plantation, nurseries, hedges and other landscape items; (xii) display hoardings without authorization; (xiii) commit an act prohibited under the Himachal Pradesh Open Places (Prevention of Disfigurement) Act, 1985; (xiv) erect welcome gates, arches etc without authorization; (xv) commit any act of omission or commission that may be notified by the Government under this section as injurious to the road infrastructures; (xvi) damage road infrastructure due to mining in the area; and (xvii) erect or construct any structure in the controlled area.

For control of land along highways and for removal of encroachments, the Government shall demarcate and enforce building lines and control lines on the private lands beyond the right way of National Highways.

Every person who intends to have the following facilities, namely: (i) an approach to private property from the road infrastructure; (ii) laying of services, such as pipeline, sewerage line, electrical cables, telephone cables etc. either along or across the road or bridge; (iii) mining activities within 50 metres from either side of existing road or 500 metres upstream or downstream of a bridge; (iv) carrying out any private or commercial activity within the acquired and controlled area; (v) display of hoardings within the acquired and controlled area; (vi) installation of hand pumps within the acquired and controlled area; (vii) parking of damaged vehicles/machinery on the road upto 48 hours; and (viii) temporary stacking of materials/goods on the road for a period not exceeding 48 hours, shall apply for permission in writing to the Executive Engineer-in-Charge of the road infrastructure within his jurisdiction in respect of facility under clauses (i) to (vi) above and to the Junior Engineer-in-Charge in respect of facility under clauses (vii) and (viii) of this Section and every such application for permission shall be in the prescribed manner.

The Himachal Pradesh Municipal Act, 1994: An Act to consolidate and amend and replace the law relating to Municipalities in Himachal Pradesh.

Classification of Municipalities: (1) There shall be constituted three classes of Municipalities in accordance with the provisions of this Section as specified: (i) *'Nagar Panchayat'* for a transitional area with population exceeding two thousand and generating annual revenue exceeding rupees in *lakhs* for the local administration; *(ii)* 'Municipal Council' for a smaller urban area with population exceeding five thousand and generating annual revenue exceeding Rupees TwentyLakhs(Rs.20Lakhs) forthelocal administration; *(iii)* 'Municipal Corporation' for a larger urban area with population exceeding fifty thousand and generating annual revenue exceeding Rupees Two *Crores (Rs. 2 Crores)* for the local administration and which has been declared to be a Municipal area under Section 3 of the Himachal Pradesh Municipal Corporation Act, 1994.

Powers and Authorities of Municipalities, Section 47: Under the provisions of Sub-section (1) of Section 47, the State Government shall, by notification endow the

Municipalities with such powers and authorities as may be necessary from time to time to enable them to function as institutions of Local Self Government, subject to such conditions as may be specified therein, with respect to: (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and implementation of schemes, which may be entrusted to them including: urban planning including town planning; regulation of land-use and construction of buildings; planning for economic and social development; roads and bridges; water supply for domestic, industrial and commercial purposes; public health, sanitation conservancy and solid waste management; fire services; urban forestry, protection of the environment and promotion of ecological aspects; safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded; slum improvement and upgradation; urban poverty alleviation; provision of urban amenities and facilities, such as parks, gardens and playgrounds; promotion of cultural, educational and aesthetic aspects; burials and burial grounds, cremations, cremation grounds and electric crematoriums; cattle ponds and prevention of cruelty to animals; vital statistics including registration of births and death; public amenities including street lighting, parking lots, bus stops and public conveniences; and (18) regulation of slaughter houses and tanneries.

Taxes that may be imposed, Section 66: (1) Subject to any, general *or special order* of the State Government on this behalf and to the rules, a Municipality may, from time to time, for the purposes of this Act, impose in the whole or any part of the Municipality any of the following taxes, tolls and fees, namely: (i) a tax on profession, trades, callings and employments; (ii) a tax on vehicles, other than motor vehicles, plying for hire or kept within the Municipal area; (iii) a tax on animals used for riding, draught or burden kept for use within the Municipal area, whether they are actually kept within or outside the Municipal area; (iv) a tax on dogs, kept within the Municipal area; (v) a show tax; (vi) a toll on vehicles other than motor vehicles, and other conveyances entering the Municipal area; (vii) a tax on boats moored within the Municipal area; (viii) A tax on the consumption of electricity at the rate of one *paise* for every unit of electricity consumed by any person within the limits of the Municipal area; (ix) a tax on advertisements other than advertisements published in the newspapers; (x) a tax on buildings payable along with the application for sanction of the building plans; (xi) a fee with regard to pilgrimages; (xii) a fee with regard to drainage; (xiii) a fee with regard to lighting; (xiv) a fee with regard to scavengers; (xv) A fee for cleaning of latrines and privies; (xvi) a fee in the nature of costs for providing internal services under the scheme framed under Section 205; (xvii) an educational cess; (xviii) a local rate on land revenue; (xvix) with the previous sanction of the State Government, any other tax, toll or fee, which the State Legislature has the power to impose in the State under the Constitution of India. (2) The rates of any tax, toll or fee under Sub-section (1) except that under clause *(viii)* thereof shall be determined by the Municipality. Provided that such rates shall not exceed the maximum limits, which the State Government may, from time to time, by notification, specify on this behalf.

Power to require hedges and trees to be trimmed, Section 122: The Municipality may, by notice, require the owner or occupier of any land to cut or trim within three days, the hedges growing thereon and bordering on any street or any branches of trees growing thereon, which overhang any street and obstruct the same or cause danger or which so overhang any well, tank or other source from which water is derived for public use, as to be likely to pollute the water thereof or are in any way offensive or injurious to health.

Provisions of drains, privies etc. Section 130 : (1) The Municipality may, by notice, require the owner of any building or land to provide, move or remove any drain, privy, latrine, urinal, cesspool or other receptacle for

filth or refuse or, provide any additional drains, privies, latrines, urinals, cesspools or other receptacles as aforesaid, which should, in its opinion, be provided for the building or land, in such manner and of such pattern, as the Municipality may direct. (2) The Municipality may, by notice, require any person employing more than twenty workmen or labourers to provide such latrines and urinals as it may think fit and to cause the same to be kept in proper order and to be daily cleaned. (3) The Municipality may, by notice, require the owner or occupier of any building or land to have any privy, latrine or urinal provided for the same shut out by a sufficient roof and wall fence from the view of persons passing by or dwelling in the neighbourhood, or to remove or alter, as the Municipality may direct, any door or trapdoor of a privy, latrine or urinal opening on to any street or drain. (4) The Municipality may, and when required by the State Government, shall provide latrines and urinals for the use of public.

Power of Municipality to lay carry wires, pipes, drains or owner through private lands, Section 137: The Municipality may carry any cable, wire, pipe, drain, sewer or channel of any kind, for the purpose of establishing telephonic or other similar communication or for carrying out and establishing or maintaining any system of lighting, drainage or sewerage, through, across, under or over any road, street, or place laid out as or intended for a road or street, and, after giving reasonable notice in writing to the owner or occupier, into, through, across, under, over or up the side of any land or building whatsoever situate within tilted limits of the Municipal area, and, for the purpose of distribution of water outfall or for the removal or outfall of sewerage without such limits and may, at all limits, do all acts and things, which may be necessary or expedient for repairing or maintaining any such cable, wire, pipe, drain, sewer, or channel, as the case may be, in an effective state for the purpose for which the same may be used or intend to be used:

Provided that such work shall be done so as to cause the least practical nuisance or inconvenience to any person.

Provided further that reasonable compensation shall be paid to the owner or occupier for any damage at the time sustained by him and directly occasioned by the carrying out of any such operations.

Depositing or throwing of earth or material of any description on roads or into drains, Section 160: Whoever, without the permission of the Municipality or in disregard of its order, throws or deposits, or permits his servants or members of his household under his control to throw or deposit earth or material or any description, or refuse, rubbish or offensive matter of any kind upon any street or public place or into any irrigation channel or public sewer or public drain or into any drain communicating with an irrigation channel or a public sewer or public drain, shall be punishable with a fine which shall not be less than Twenty Five Rupees (Rs. 25/-) and more than Two Hundred Rupees (Rs 200/-).

Spitting in places other than drains or receptacles provided, Section 161: Whoever, in a public place within the limits of a Municipal area to which the operation of this section has been extended by a notification by the State Government on this behalf, spits in a place other than a drain or a receptacle provided by the Municipality for this purpose, shall be punishable with a fine, which shall not be less than Twenty Five Rupees (Rs. 25/-) and more than Two Hundred Rupees (Rs 200/-)..

Powers in connection with streets, Section 174: The Municipality (a) may lay out and make a new public street and construction tunnels and the works thereto; *(b)* may widen, lengthen, extend, enlarge, raise or lower the level of, or otherwise, improve any existing public street vested in the Municipality; *(c)* may close temporarily any public street or any part thereof for any public purpose; *(d)* may turn, divert, discontinue or close any public street so vested; *(e)* may provide within its discretion

building sites of such dimensions as it deems fit, to abut on or adjoin any public street made, widened, lengthened, extended, enlarged, improved, or the level of which has been raised or lowered by the Municipality under clauses *(a)* and *(b)* or by the State Government; (f) subject to the provision of any rule prescribing the conditions on which property may be acquired by the Municipality may acquire any land, along with the building thereon, which it deems necessary for the purpose of any scheme or work undertaken or projected in exercise of the powers conferred under the preceding clause; *(g)* subject to the provisions of any rules prescribing the conditions on which property vesting in the Municipality may be transferred, leased, sold or, otherwise, dispose off any property acquired by the Municipality under clause *(f);* or any land vesting in and used by the Municipality for a public street and no longer required thereof and in so doing may impose conditions regulating the removal and construction of buildings upon it and the other uses to which such land may be put.

Provided that the land owned by proprietors other than the State Government shall become the absolute property of the Municipality after it has continuously vested in the Municipality for use as a public street for a period of twenty five years; but that the possession of such land which ceases to be required for use as a public street before the expiry of twenty five years from the time it became vested in the Municipality shall be transferred to the proprietor thereof, on payment by him of reasonable compensation to the Municipality for the improvement of such land, and subject to such restrictions as the Municipality may impose on the future use of such land, and that should the proprietor be unable or unwilling to pay the amount of such compensation, the Municipality may, subject to such conditions as it may deem fit, sell the land and shall pay to the owner the proceeds, over and above the amount of such compensation, which shall be paid into the Municipal fund, or may dispose off it in such manner as it may deem fit.

Protection of streets during cutting down of trees, erection or demolition of buildings, Section 175: (1) No person shall cut down any tree or cut off a branch of any tree, or erect or demolish any building or a part of a building or alter or repair the outside of any building, where such action is of a nature to cause obstruction, danger or annoyance, or risk of obstruction, danger or annoyance to any person using a street, without the previous permission in writing of the Municipality. (2) The Municipality may, at any time by notice, require that any person doing or proposing to do any of the acts, referred to in Sub-sub-section (1) shall refrain from beginning or continuing the act unless he puts up, maintains, and provides from sun-set to sun-rise with sufficient lighting for such hoardings or screens, as are specified or described in the notice... and may further, at any time by notice, require to be removed, within a time to be specified in the notice, any hoarding or screen erected in anticipation or in pursuance of any of the said acts. (3) Whoever contravenes the provisions of Sub-section (1) or fails to comply with the terms of a notice under Sub-section (2) shall be punishable with a fine, which shall not be less than Twenty Five Rupees (Rs. 25/-) and more than Two Hundred Rupees (Rs. 200/-) and when the contravention of non-compliance is a continuing one, with a further fine of ten rupees(Rs. 10/-) for every day after the first during which the contravention or non-compliance continues.

Notice to Layout Street, Section 176: (1) No person shall layout or make or commence to layout or make a street without the sanction of the Municipality. (2) Every person, who intends to layout or make a street, shall give notice in writing to the Municipality of such intention. (3) Where a Municipality has issued an order under clause *(b)* of Section 177, no notice under Sub-section (2) shall be deemed to be valid until the particulars required under such order have been furnished to the satisfaction of the Municipality.

Order on Notice Under Section 176, Section 177: The municipality may, within one

month of the receipt of the notice required by Sub-section (2) of Section 176, issue: *(a)* an order directing that for a period therein specified, which shall not be longer than one month from the date of such order, the intended work shall not be proceeded with; or *(b)* an order requiring further particulars.

Sanction of New Street, Section 178: The Municipality may, within two months of the receipt of the notice required by Sub-section (2) of Section 176 refuse to sanction the proposed street, or may sanction it either absolutely or subject to such written direction as to leveling, metalling, paving by means of drainage, direction and width as the Municipality may deem fit to issue, and the person laying out or making such streets shall comply with the sanction of the Municipality in every particular; provided that should the Municipality neglect or omit for two months after the receipt of such notice, or if an order has been issued under clause *(b)* of section 177, fails within the period specified in such order, to make and deliver to the person, who has given such an order of sanction or refusal in respect thereof, it shall be deemed to have sanctioned the proposed street absolutely.

Operation of Sanction, Section 179: Every sanction for the laying out or making of a street, which shall be given or be deemed to have been given, by a Municipality, shall remain in force for one year only from the date of such sanction. Should the laying out or making of the street have not been commenced within the said period of one year, the sanction shall be deemed to have lapsed, but such lapse shall not bar any subsequent application for fresh sanction under the foregoing provisions of this Act.

Explanation - A street shall be deemed to be made or laid out when it is demarcated on the ground made by permanent boundary marks. Penalty Section 180, Whoever begins, continues or completes the laying out or making of a street without giving the notice required by Section 176 or in contravention of any written directions made under Section 178 or of any bye-law or provision of this Act, shall be liable to a fine, which shall not be less than Fifty Rupees (Rs. 50/-) and more than Five Hundred Rupees (Rs. 500/-).

Notice to Owner of Land under Street, Section 181: In any case where the Municipality considers that any land is being or has been laid out as a street without the notice required by section 176 having been given or in contravention of any written direction made by the Municipality under section 178 or of any bye-law or provisions of this Act, the Municipality may, by notice in writing, require the owner of the land to alter the street in such manner as it deems necessary.

Power to Require Repairs of Streets and to Declare such Street Public, Section 182: (1) *(a)* When the Municipality considers that in any street other than a public street, or in any part of such street within the Municipal area, it is necessary for public health, convenience or safety, that any work should be done for the leveling, paving, metalling, flagging, channeling, draining, lighting or cleaning thereof, the Municipality may, by written notice, require the owner or owners of such streets or part thereof, to carry out such works in a manner and within a time to be specified in such notice; *(b)* should the owner refuse or should he fails to carry out the work in the time specified, the Municipality may, by written notice, require the owners of the land or buildings, fronting, adjoining, or abutting upon such street or part thereof to carry out the work in such manner and within such time as may be specified in the notice. (2) If compliance with the terms of the notice issued under clause *(b)* of Sub-section (1) is not effected within the time specified, the Municipality may, if it thinks fit, itself execute the work and may recover, as arrears of tax under Section 87, the expenses incurred in doing so in such proportion as it may deem equitable from the owner of the street and the persons served with a notice under clause *(b)* of Sub-section (1). (3) After such work has been carried out by the persons served with a notice under clause *(b)* of Sub-section (1) or as provided in Sub-section (2) by the Municipality

at the expense of such persons and the owner of the street, the street or part thereof, in which such work has been done, may, and on the requisition of the owner or owners of the major portion of the said street or part thereof or on the requisition of a majority of the persons served with a notice under clause *(b)* of Sub-section (1), it shall be declared, by a public notice to be put up therein, by the Municipality to be a public street and shall vest in the Municipality. (4) A Municipality may, at any time by notice, fixed up in any street or part thereof not maintainable by the Municipality, *give* intimation of their intention to declare the same as a public street, and unless within one month after such notice has been so put up, the owner or any one of several owners of such street or such part of a street lodge objection thereto at the Municipal office, the Municipality may, by notice in writing, put up in such street, or such part, declare the same to be a public street vested in the Municipality.

Punishment for Encroachment or Over-hanging Structure over Street, Section 183: (1) Whoever, without the written permission of the Municipality, makes any immovable encroachment on or under any street, on, over or under any sewer, or water course, or erects or re-erects any immovable overhanging structure projecting into a street at any point above the said ground level, shall be punishable with a fine, which shall not be less than Twenty Five rupees(Rs.25/-)andmorethanTwo Hundred Rupees (Rs. 200/-). (2) Without prejudice to the provisions of Sub-section (1), the Municipality may, by notice, call upon any person, who has committed a breach of the provisions contained in the said Sub-section to stop the unauthorized construction forthwith and to remove or alter such immovable encroachment or over hanging structure as aforesaid within a period of seven days and if such person fails to show cause to the satisfaction of the Municipality within the said period of seven days, the Municipality may itself take such measures as may appear to it to be necessary to give effect to the order and the cost of such measures shall, if not paid on demand being made to him, be recoverable from such person as arrears of land revenue.

Permission of Occupation of Public Street and Removal of Obstruction, Section 184: (1) The Municipality may grant permission in writing, on such conditions as may be approved by the Deputy Commissioner for the safety or convenience of persons passing by or dwelling or working in the neighborhood, and may, at its discretion, withdraw the permission given to any person to: *(a)* place in front of any building any moveable encroachment upon the ground level of any public street or over or on any sewer, drain or water course or any moveable over hanging structure projecting into such public street at a point above the said ground level; *(b)* take up or alter the pavement or other materials for the fences of posts of any public street; *(c)* deposit or cause to be deposited building materials, goods for sale, or other articles on any public street; *(d)* make any hole or excavation on, in or under any street, or remove materials from beneath any street, so as to cause risk of subsidence; or *(e)* erect or set up any fence, post, stall or scaffolding in any public street, and may charge fees according to a scale to be approved by the Deputy Commissioner for such permission. (2) Whoever does any of the acts mentioned in Sub-section (1) without the written permission of the Municipality shall be punishable with a fine, which shall not be less than Twenty Five Rupees (Rs. 25/-) and more than Two Hundred Rupees (Rs. 200/-) and the Municipality or the Executive Officer or the Secretary or the Health Officer or any person authorised by the Municipality may: *(i)* after reasonable opportunity has been given to the owner to remove his material and if he has failed to do so, remove or cause to be removed by the Police, or any other agency, any such moveable encroachment or over hanging structures and any such materials, goods or articles of merchandise and any such fence, post, stall, or scaffolding; *(ii)* take measures to restore the street to the condition it was in before any such alteration, excavation or damage. (3) If the material specified in clause (I) of Sub-section (2) has not been claimed by

the owner within a fortnight of its having been deposited for safe custody by the Municipality or if the owner fails to pay to the Municipality the actual cost of removal or deposit in safe custody, the Municipality may have the material sold by auction at the risk of the owner, and the balance of the proceeds of such sale shall, after deduction of the expenditure incurred by the Municipality, be paid to the owner, or if the owner cannot be found, or refuses to accept the payment, the balance shall be kept in deposit by the Municipality until claimed by the person entitled thereto, and if no claim is made within two years, the Municipality may credit the amount to the Municipal fund.
Explanation.-For the purposes of this Section, moveable encroachment includes a seat or settee, and moveable over hanging structure includes an awning of any material.

Power of Deputy Commissioner to Remove Encroachments, Section 185: Notwithstanding anything contained in Sections 183 and 184, the Deputy Commissioner may, within his jurisdiction, order any person responsible for any encroachment as specified in Sections 183 and 184 to remove or alter such encroachment within a specified tine not exceeding two weeks and on non-compliance with such order may remove or alter such encroachment and recover all expenses thereby incurred from the person, as arrears of tax under Section 87.

Power to Regulate Line of a Street, Section 186: (1) Should any house, shop, wall or other building or part of a building project beyond the regular line of a street, either as existing or as determined for the future, or beyond the front of the building on either side thereof, the Municipality may, whenever such house, shop, wall or other building or part thereof, has been either entirely or in greater part taken down or burned down, or has fallen down, by notice require such building or part when being rebuilt to be set back to or towards the said regular line or the front of the adjoining buildings; and the portion of the land added to the street by such setting back or removal shall become a part of the street and shall vest in the Municipality; provided that the Municipality shall make full compensation to the owner of the building, or of the land thus vacated, for any damage he may sustain in consequence of his building or any part thereof being set back.
(2) The Municipality may, on such terms as it may think fit, allow any building to be set forward for the improvement of the line of the street.

Government Street's, Section 187: Notwithstanding anything contained in Sections 183, 184 or 186, or in clause *(v)* of Section 202 and subject to any general or special order that the State Government may make on this behalf, if any street is vested in the State Government: *(a)* the Municipality shall not, in respect of such street, grant permission to do any act, the doing of which, without the written permission of the Municipality, is punishable under Section 183 or Section 184 or allow any building to be set forward under the provisions of Sub-section (2) of Section 186, except with the sanction of the State Government, which may be given in respect of a class of cases, generally, or in respect of a particular case; *(b)* the Municipality shall, if so required by the State Government, exercise the power conferred upon it by Sub-section (2) of Section 183 or Sub-section (2) of Section 184 or Sub-section (1) of Section 186 or clause *(v)* of Section 202 or any bye-law, exercised the power conferred by clause*(v)* of Section 202 in respect of any encroachment or over hanging structure on or over such street or any material, goods or articles of merchandise deposited on such street, or fence, post, stall or scaffolding erected or set up in any such street or in respect of any building or part of a building, which projects beyond the regular line of such street.

Removal of Over Hanging Structures, Section 188 and 189: The Municipality may, subject to the payment of reasonable compensation, by notice, require the owner or occupier of any building within a period of not less than six weeks, to be specified in such notice, to remove or alter any balcony,

projection, structure or verandah, erected with the sanction of the Municipality, over hanging, projecting into or encroaching on any street or on any drain, sewer or aqueduct therein. Further, the Municipality may attach to the outside of any building brackets for lamps in such manner as not to occasion any injury thereto or inconvenience.

Construction of Stalls, Section 190: The Municipality may, and if so required by the State Government, shall construct stalls, and shall lease them out to any person on such conditions as the State Government may, by general or special order, specify.

Names or Numbers of Streets Buildings etc., Section 193: (1) The Municipality may cause a name or number to be given to any street, *chowk*, locality or building, and to be affixed on any *chowk*, locality or building in such place as it may think fit. (2) Whoever shall destroy, pull down or deface any name or number affixed to any street, *chowk*, locality or building under this Section or put up any different name or number from that put up by order of the Municipality shall be punishable with a fine, which shall not be less than Twenty FiveRupees(Rs.25/-)andmorethanTwo Hundred Rupees (Rs. 200/-).

General Bye-laws, Section 202: A Municipality may, and shall if so required by the State Government by bye-laws.

(a) render licences necessary for the proprietors or drivers of vehicles, other than motor vehicles or animals kept or plying for hire within the limits of the Municipal area, and fix the fees payable for such licences and conditions on which they are to be granted and may be revoked and may, by such conditions, provide among other things for a minimum breadth for wheel tyres and for a minimum diameter of the wheel;

(b) limit the rates which may be demanded for the hire of any carriage cart, or other conveyance, or of animals hired to carry loads or persons or for the services of persons hired to carry loads or to impel or carry such conveyances and limit the loads, which may be carried by any animal, or carriage, cart, or other conveyance, plying for hire, within/the limits of the Municipal area;

(c) provide, save as provided under the Registration of Birth and Deaths Act, 1969 for the 'proper registration of births and deaths and for recording vital statistics;

(d) fix and, from time to time vary, the number of persons who may occupy a building or part of a building, which is let out as lodgings or occupied by members of more than one family or which is situated within such congested bazaar areas as may be specified in the bye-laws; and provide for the registration and inspection of such building; for the licensing of hotels and lodging-houses and for the fees payable for such licences and the condition on which they may be granted or revoked; for promoting cleanliness and ventilation in such buildings; for the notices to be given and the precautions to be taken in the case of any infectious or contagious disease breaking out in such buildings; for the scavenging, removal and disposal of all rubbish, filth, night-soil, sullage or sewage in such buildings; in the case of hotel, *sarai* and lodging house-keepers and the secretaries of residential clubs for the maintenance of registers in such forms as the Municipality may prescribe, of visitors and lodgers; generally for the proper regulation of such buildings;

(e) provide:

(i) for the inspection and proper regulation of encamping grounds, ponds, *sarais*, bakeries, aerated water factories, ice factories, *dhobi ghats*, flour mills, food grain godowns, dispensing chemist shops, slaughter-houses, and places licensed under section 125;

(ii) for the inspection and proper regulation of markets and stalls, for the preparation and exhibition of a list of current price and

fixing the fees, rents and other charges to be levied in such markets and stalls;

(iii) for the holding of fairs and industrial exhibitions within the Municipal area, or under the control of the Municipality, and for the collection of fees under section 201;

(iv) for controlling and regulating the use and management of burial and burning grounds;

(v) for the supervision, regulation and protection of public wells, tanks, springs or other sources from which water is or may be made available for the use of the public, whether within or outside the Municipal area;

(vi) for the licensing, inspection and proper regulation of theatres and other places of public resort, recreation or amusement;

(vii) for the inspection and proper regulation of channels, which are supplied with water from any canal to which either the Northern Indian Canals and Drainage Act, 1873, or the Himachal Pradesh Minor Canals Act, 1976, applies;

(f) require and regulate the appointment by owners of buildings or land in the Municipal area, who are not resident in the Municipal area, or persons residing within or near the Municipal area to act as their agents for all or any of the purposes of this Act or the rules;

(g) render licences necessary for using premises such as stables, cow-houses or houses of enclosures for sheep, goats, or swine, and regulate the grant and withdrawal of such licences;

(h) in any Municipal area where a reasonable number of slaughter houses have been provided or licenced by the Municipality, control, regulate or prohibit the admission within the Municipal limits for the purpose of sale of the flesh other than cured or preserved meat, of any cattle, sheep, goat or swine slaughtered at any slaughter-house or place not maintained or licenced under this Act, and 'may provide for the seizure, destruction or disposal otherwise of any flesh brought within' Municipal limits in contravention of any such bye-law;

(i) fix preemies within the Municipal area in which tile slaughter of animals of any particular kind not for sale, shall be permitted, and prohibit, except in case of necessity, such slaughter elsewhere within the Municipal area; provided that no such bye-laws shall apply to animals slaughtered for any religious purpose;

(j) prohibit the letting off of fire-arms, fireworks, fire-balloons, bombs or detonators; except

(1) with the permission of the Municipality or of a Municipal officer empowered to give such permission;

(2) subject to such conditions as the Municipality may impose, and

(3) on payment of such fees, if any, as may, at any time, have been fixed by the Municipality on that behalf;

(k) regulate the conditions on which the consent of Municipality to establish new factories or workshops be given under Section 126;

(l) provide for the issue of directions for abatement of nuisance caused by steam, water, electrical, mechanical or other power;

(m) regulate the making and use of connections or communications between private houses and premises and mains or service cables, wires, pipes, drains, sewers and other channels established or maintained by the Municipality under any of the provisions of this Act;

(n) regulate the collection, storage, preservation from pollution and use of rain water, and the carrying out of the provisions of Sections 100 to 106;

(0) regulate the posting of bills and advertisements, and the position, size, shape, and style of name boards, sign-boards and sign-posts;

(p) provide for, regulate, require or prohibit the construction, pattern of construction, maintenance and materials of boundary

walls, hedges and fences hereafter erected or re-erected so as to abut on a public street or upon property vested in the Municipality;

(q) regulate or prohibit any description of traffic in the streets and provide for the reduction of noise caused thereby;

(r) prohibit the storage of more than a fixed maximum quantity of any explosive, petroleum, spirit, naptha or other inflammable material in any building not registered or licensed under Section 125;

(s) provide for the seizure and confiscation of ownerless animals straying within the limits of the Municipal area;

(t) provide for the registration of all or any specified classes of dogs in particular and without prejudice to the generality of the foregoing:

(i) provide for the imposition of an annual fee for such registration;

(ii) require that every registered dog shall wear a collar to which shall be attached a metal token to be issued by the Municipality;

(iii) provide that any dog not registered and wearing such token, may, if found in any public place, be detained at a place to be set apart for the purpose and will be liable to be destroyed otherwise disposed of after a period to be specified in the bye-laws;

(u) render licences necessary for hand-carts employed for transport, or hawking articles for sale, and for the persons using such hand-carts, and prescribe the conditions for the grant and revocation of such licences;

(v) regulate the conditions on which and the period for which permission may be given under Sub-section (I) of Section 183 and Sub-section (I) of Section 184, and provide for the levy of fees and rents for such permission;

(w) provide for the registration, inspection and proper regulation of building ordinarily utilised for the residence or treatment of persons suffering from infectious diseases and for the limiting of the number of such persons who reside in such buildings or part of such buildings;

(x) generally provide for carrying out the purposes of this Act;

(y) for regulating or prohibiting the cutting or destroying of trees or shrubs, or the making of excavations or removal of soil or quarrying, where such regulation or prohibition appear to the Municipality to be necessary for the maintenance of water supply, the preservation of soil, the prevention of landslips or of the formation of ravines or torrents, or the protection of land against erosion or the deposit thereon of sand, gravel or stones;

(z) for fixing places where timber or wood of any description may be stacked, and for regulating the manner in which such timber or wood, as the case may be, stacked, where such regulation appears to the Municipality to be necessary for the prevention of fire or other danger or grave inconvenience to the public or of landslips or other injurious disturbance of the surface of any land; *(za)* for fixing charges in the Municipal area:

(i) for persons working as job porters for the conveyance of goods;

(ii) for animals or carriages let out on hire for a day or part thereof; and

(iii) for persons impelling or carrying carriages;

(zb) for fixing the fees payable for such licences as are referred to in this section, and the conditions on which such licences are to be granted and may be recovered.

Prevention of Soil Erosion and Hill Side Safety

Regulation of Felling of Trees within Municipal Limits, Section 221: (1) No person shall fell any tree whether belonging to him or otherwise of the prescribed class within the jurisdiction of any Municipality in the State except under a permit obtained from the prescribed authority in the prescribed manner.

Explanation - For the purposes of this Chapter, the expression 'felling of tree' shall include cutting or destroying or causing or suffering to

be cut or destroyed any tree, but shall not include bonafide pruning, trimming or otherwise altering shrubs or fruit trees for purely horticultural purposes and other petty acts, such as, the cutting of twigs, digging of ferns and the like from which no material harm of any kind to person or property is likely to result.

(2) No application for grant of permit for felling of tree shall be entertained unless it is accompanied by a fee of Rs. 10/- which amount shall be utilised for fresh plantation.

(3) (i) A breach of the provision for Sub-section (1) or abetment of breach thereof in respect of cutting or destroying of each tree of the prescribed class shall be a separate offence and shall be punishable with imprisonment, which may extend to three months or with fine, which may extend to five hundred rupees, or with both;

(ii) when any person is convicted for breach of the provision of Sub-section (1), the court convicting such person shall, in addition to the punishment imposed, order forfeiture in favour of the concerned Municipality of any tree/fuel/timber in whatever form it may have been converted and in respect of which the breach of the provisions of Sub-section (1) is made and in case such tree/fuel/timber are not available for forfeiture, the market value thereof as determined by the court shall be recoverable from him in the same manner as fine imposed; *(iii)* no office or breach of the provisions of Sub-section (1) shall be compounded by any authority empowered to compound, without providing for forfeiture of the tree, fuel or timber in favour of the concerned Municipality;

(iv) Any officer especially empowered on this behalf by the State Government, having reason to believe that a breach of such provision of the Act has been committed or is likely to be committed, may seize the tree, fuel or timber in respect of which such breach has been committed and also all tools used or likely to be used in the commission of such offence and all these articles shall, on conviction of the offender or on the composition of the offence, be forfeited to the concerned Municipality. *Explanation -For* the purpose of this Sub-section, the term 'Municipality' means the Municipal Council or *Nagar Panchayat*, as the case may be.

(4) The. State Government may make rules consistent with this Act to carry out the purposes of this Chapter and all such rules shall be laid before the Legislative Assembly.

Development Plans and District Planning Committee

District Planning Committee, Section 260: Every Municipality shall prepare every year a development plan for its area and submit it to the District Planning Committee.

Section 261:

(1) The District Planning Committee, constituted by the State Government under Section 185 of the Himachal Pradesh *Panchayati Raj* Act, 1994 shall consolidate the development plans prepared and submitted to it by the Municipalities in the District, under Section 260 and prepare a draft development plan for the district as a whole.

(2) The persons to represent the Municipalities in the District Planning Committee, under clause *(d)* of Sub-section (2) of Section185 of the Himachal Pradesh *Panchayati Raj* Act, 1994, shall be chosen by the elected members of the Municipalities in the District in the prescribed manner from amongst themselves.

(3) Every District Planning Committee shall, in preparing the draft development plan, *(a)* have regard to: (i) matters of common interest between the Municipalities and *Panchayats* including spatial planning, sharing of water and other physical and natural resource, the integrated development of infrastructure and environmental conservation; *(ii)* the extent and type of available resources whether financial or otherwise; (b) consult such institutions and organisations as the State Government may, by order, specify.

(4) The Chairperson of every District Planning Committee shall forward the development plan, as recommended by such committee to the State Government.

The Himachal Pradesh Municipal Business Bye-Laws, 2006: The General Standing Committee shall perform functions relating to: (a) Establishment matters; (b) Communication of general nature; (c) Building regulations etc.; (d) Urban Housing Projects etc.; (e) Relief against natural calamities; (f) Water Supply for the Town; (g) To enquire and report on all matters relating to Municipal works, maintenance and verification of Municipal properties and *nazual* properties, roads and buildings under the control of the Municipality. It shall also supervise all Municipal works connected with buildings, road, drains etc.

The Municipal Medical Officer of Health shall be in-charge of the Sanitation, Public Health and Health Departments of a Municipality. He shall supervise the sanitary conditions of all buildings and lands, burial and burning places, markets, slaughter houses, streets, drains, sewerage, latrines, urinals, filth receptacles, cesspool, flushing appliances, farms, filth depots, dairies, milk shops, cow sheds, stables, meat shops and all shops dealing in edibles, bakeries, aerated water factories, wells and *dhobi ghats* etc. He shall also check the houses unfit for human habitation, offensive trades, foods and drinks, plants and stores.

The Municipal Engineer shall be in-charge of the Engineering and Building Department. He shall be responsible for house connections of filtered water, supply system, road lighting, water meters, Municipal lands and properties, machinery, plants and stores and shall maintain registers and stock book laid down in the Municipal Accounts Code and the Municipal Works Rules.

The Himachal Pradesh Town and Country Planning Act, 1977: This Act seeks to: make provision for planning and development and use of land; make better provision for the preparation of development and sectoral plans with a view to ensure that town planning schemes are made in a proper manner and their execution is made effective; constitute the Town and Country Development Authority for proper implementation of town and country development plan; provide for the development and administration of special areas through the Special Area Development Authority; make provision for the compulsory acquisition of land required for the purpose of the development plans and for connected purposes.

The Act mandates preparation of development plan, regional and sector plans and tourist development schemes. A development plan shall consist of (i) residential, industrial, commercial or agricultural purposes; (ii) open spaces, parks and gardens, green belts, zoological gardens and play-grounds; (iii) lay down the pattern of National and State Highways connecting the planning area with the rest of the region and ring roads, arterial roads and other major roads within the planning area; (iv) project the requirement of the planning area of such amenities and utilities as water, drainage, electricity and suggest their fulfillment; (v) lay down the broad-based traffic circulation patterns in a city; (vi) indicate measures for flood control, prevention of air and water pollution, disposal of garbage and general environmental control.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in local administration and developmental activities.

Chapter III of this Act states framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing

scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for the maintenance and repair (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act pertains to special provision relating to the *Gram Panchayats, Panchayat Samiti and Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) Approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat*, at the village level; (ii) Be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Chapter-XII of this Act pertains to development plans and District Planning Committee. The provisions under preparation of development plans include (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) Every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute, in every district, a District Planning Committee to consolidate the plans prepared by the *Zila Parishad, Panchayat Samitis, Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

Government of Himachal Pradesh has Constituted Tourism Development Council for Shimla and Mandi under Himachal Pradesh Tourism Development and Registration Act, 2002. The functions of Tourism Development Council are to provide and maintain tourism related services; assist the local body in maintaining infrastructural facilities at tourist spots; build and maintain tourism and recreational facilities, which may enhance the tourism value of the area; prepare Tourism Master Plan for the area; and maintain and operate a Tourism Destination Fund. The council can also raise resources for development of infrastructure and facilities by way of fees, cess etc. However, Tourism Destination Fund has not been established for Shimla yet. Besides, Tourism Development Council, for Manali and Kullu district has also been constituted vide notification no. TSM F3-2/2003-I dated 7.7.2004.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This Act defines the functions of Tourist Development Board under Section 8 of Chapter II. Section 17, Chapter III of the Act describes the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the function of the council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spot, environmental upgradation etc.; assist the local body in maintaining sanitation and infrastructure facility at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities; prepare a Tourism Master Plan for its area and all tourism units and

establishment shall conform to the Master Plan.

The Himachal Pradesh Aerial Ropeways Act, 1968 (Act No. 7 of 1969): Its an Act to authorise, facilitate and regulate the construction and working of aerial ropeways in Himachal Pradesh. Under Article 29, of Chapter X of this Act, there is a provision of protection of waterways. No promoter shall, in the course of the construction, repair, working or management of an aerial ropeway, cause any permanent injury to any public road, railway, tramway or waterway, or obstruct or interfere with any waterway.

Himachal Pradesh Bricks (Control) Act, 1969: It is intended to regulate the manufacture, storage, distribution, transport, acquisition and disposal of bricks in the Himachal Pradesh and for matters connected therewith.

Himachal Pradesh Bricks (Control) Act, 1969, notification Shimla−2, the 14th October, 1970 as amended up to 31−07−93: Section 4 (ii) of the Act states "Subject to the general or special instructions notified by the State Government, from time to time, on this behalf, a license may, if the site of the kiln is not detrimental to the health of the general public or to the crops, gardens or nurseries in close proximity thereto, be granted or renewed by the District Magistrate."

Other Sub-programmes / Strategies

Present Status of Scheme for Support to Public Private Partnerships in Infrastructure Projects (Viability Gap Funding): Scheme for support to Public Private Partnerships (PPP) in Infrastructure projects has been approved by the Cabinet recently. The Department of Economic Affairs has issued guidelines for the scheme, which envisages viability gap funding support to eligible projects. In order to make maximum utilization of this assistance window, Department of Economic Affairs has suggested that the Ministries, which do not have a Model Concession Agreement (M.C.A.), may initiate steps to formulate such a Model Concession Agreement. This Ministry has requested Water and Sanitation Programme South Asia to prepare MCA for water supply and sanitation sector. Department of Economic Affairs has issued a notification regarding setting up of an Empowered Committee and Empowered Institution. An outlay of Rs. 600 *crores* has been sanctioned in the current financial year, i.e., 2005-06 for the scheme. Guidelines have been circulated to all State Governments/UTs for information and necessary action. M.C.A. is under preparation of Water and Sanitation Programme South Asia.

Sectors Eligible for Viability Gap Funding under this Scheme are: Roads and bridges, railways, seaports, airports, inland waterways, power, urban transport, water supply, sewerage, solid waste management and other physical infrastructure in urban areas; infrastructure projects in Special Economic Zones; and International Convention Centres and other tourism infrastructure projects.

Pooled Finance Development Fund (PFDF) Scheme: Central Government has set up a Pooled Finance Development Fund (PFDF) to provide credit enhancement to ULBs to access market borrowings based on their credit worthiness through State-Level-Pooled Finance Mechanism. The broad objectives of PFDF are to: facilitate development of bankable urban infrastructure projects through appropriate capacity building measures and financial structuring of projects. Bankable projects within the context of PFDF are defined as those projects structured with appropriate credit enhancement measures in such a way that they demonstrate the capacity for servicing the market debt to the satisfaction of the rating agencies and potential investors; facilitate Urban Local Bodies to access capital and financial markets for investment in critical Municipal infrastructure by providing credit enhancement grants to State Pooled Finance Entities (SPFEs) for accessing capital markets

through Pooled Financing Bonds on behalf of one or more identified ULBs for investment in identified urban infrastructure projects; reduce the cost of borrowing to local bodies with appropriate credit enhancement measures and through restructuring of existing costly debts; and facilitate the development of Municipal Bond Market.

For implementing Pooled Finance Mechanism, a State Pooled Finance Entity (SPFE) shall be required to be set up in each State. Each SPFE is to be primarily State designed and could either be a Trust or a Special Purpose Entity, provided that the entity is only a pass through vehicle. The basic advantage of setting up of SPFE would be that it would enable the ULBs to enter the bond market on a regular basis and take advantage of scaled up operations. Further, efficient SPFEs can generate fair degree of goodwill in the bond market and may be able to achieve much higher levels of efficiency in operations than individual ULBs. Most importantly, it shall be able to hedge risks against much larger spectrum of activities than individual ULBs.

The Central Government would support SPFEs through the PFDF. Of the funds made available with the Central Government for PFDF, five percent would be utilised for project development assistance.

Balance 95 percent would be utilised for contribution to the Credit Rating Enhancement Fund (CREF) to improve the credit rating of the Municipal Bonds to investment grade.

Cost of project development for each Municipality/ULB would be worked out. 75 percent of these costs would be reimbursed by the Central Government and 25 percent by the State Government/Union Territory Government/ULBs.

Cost of transaction, including appointment of advisors, rating agencies and creation and operationalisation of SPFEs may also form part of this package. Contribution by the Central Government to the CREF will be 10 percent of the proposed amount of Bond issue or 50% of the CREF requirement as determined by a credit rating agency for investment grade rating, whichever is less. Respective State Government / Union Territory Government will contribute the balance amount.

The bonds issued under the Pooled Finance framework will be eligible for tax-free status under the Ministry's Guidelines on Tax Free Municipal Bonds, incorporating SPFEs being Trusts as Eligible Issuers for which necessary amendment to Income Tax Act is to be made by the Ministry of Finance. However, interest and dividend income earned from investments made from the CREF corpus will not be exempted from the income tax.

Integrated Development of Small and Medium Towns (IDSMT) Scheme: The main objectives of IDSMT scheme are: a) Improving infrastructural facilities and helping in the creation of durable public assets in small and medium towns; b) Decentralising economic growth and employment opportunities and promoting dispersed urbanisation; c) Increasing the availability of serviced sites for housing, commercial and industrial uses; d) Integrating spatial and socio-economic planning as envisaged in the Constitution (74th Amendment) Act, 1992; (e) Promoting resource-generating schemes for the urban local bodies to improve their overall financial position.

IDSMT Scheme will be applicable to towns/cities with population upto five *lakhs*. Towns are to be identified and prioritised by the State Governments and Union Territories according to their urban strategy within the framework of Guidelines of the Scheme. The IDSMT Scheme will be applicable to only those towns where elections to the local bodies have been held and elected bodies are in place.

Components for funding include: Strengthening of Master Plan road facilities

including ring, arterial, bypass/link roads and small bridges; Sites and services; Development of bus/truck terminals; Construction/upgradation of Master Plan drains including Storm water channels; Solid waste management; Development of market complexes/shopping centres; Provision of tourist facilities; Development of city/town parks; Street lighting for Master Plan roads; Slaughter houses; Major public amenities, like gardens, playgrounds; marriage halls, pay-and-use toilets etc.; Cycle/rickshaw stands; Traffic improvement and management schemes; Construction of retaining walls and slope stability measures in hill station towns; and social amenities, specially for the poorer sections.

To enable the preparation of project reports under IDSMT Scheme grant-in-aid will be available to State Governments/Municipalities on 60 (Central grant):40 (State grant) basis with total cost restricted to Rs. 3.00 *lakhs* to towns with population up to 50000, Rs. 4.00 *lakhs* for towns with population between 50000 and 1,00,000, Rs. 5.00 *lakhs* for towns with population between 1,00,000 and 3,00,000 and Rs. 6.00 *lakhs* for towns with population between 3,00,000 and 5,00,000 under the Central Urban Infrastructure Support Scheme (CUISS). In Himachal Pradesh, 24 towns have been covered under the scheme.

Capacity Building Scheme for Urban Local Bodies (CBULB): Ministry of Urban Development, Government of India has formulated a Capacity Building Scheme for Urban Local Bodies (CBULB). This scheme is aimed at strengthening Urban Local Governments through capacity building for better governance and financial management as articulated in the 11th Plan. The scheme covers a wide range of activities with respect to capacity building, like setting up of Centres of Excellence, addressing specific gaps in urban planning, preparation of city development plans, Detail Project Reports implementation of property tax reforms, e-Governance, accounting reforms etc. The financial support under the capacity building programme shall be extended to the identified institutions/ cities/ States for: 1. Setting up of Centres of Excellence; 2. Addressing specific capacity gaps including urban planning, socioeconomic and environmental planning, project implementation and management, preparation of detailed project reports, Municipal service delivery including water supply, sewerage and sanitation, solid waste management, financial management, urban transport, cost recovery and user charges etc.; 3. Implementation of capacity building programme in pursuance of National Urban Sanitation Policy; 4. Implementation of Municipal reforms, like property tax reforms, accounting reforms, e-Governance, Public-Private Partnership etc.; 5. Applied research and development programmes related to water supply, sanitation, solid waste management, urban development etc.; 6. Communication and outreach activities like documentation and dissemination, website, workshops/seminars/conferences etc.; and 7. Monitoring & evaluation of the activities undertaken.

Jawahar Lal Nehru Urban Renewal Mission (JNNURM): JNNRUM was launched in the month of December, 2005 for developing basic urban infrastructure and urban slum development in 63 cities of India.

The objectives of JNNURM are to assist cities achieve focused attention to integrated development infrastructure services and meet the deficiencies in infrastructure projects; secure effective long term sustainability of projects by establishing linkages between asset creation and management through reforms, so that the infrastructural services created in the cities are not only maintained efficiently, but also become self-sustaining over time.

Urban Renewal include redevelopment of inner (old) city areas: This would include items, like widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner-city) areas to conforming (outer-city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones,

renewal of sewerage/drainage/solid waste disposal system etc. Land acquisition cost will not be financed under this component of the programme. Water supply including setting up de-salination plants, where necessary; Sewerage and Solid Waste Management; Construction and improvement of drains / storm water drains; Urban transport; Laying / improvement / widening of arterial / sub-arterial roads and bridges to remove transport bottlenecks; Laying of ring roads and by-passes around metro and mega cities, provided certain cost recovery measures like toll charges are built in; Construction and development of bus and truck terminals; Environmental improvement and city beautification schemes; Construction of working women hostels, marriage hall, old age and destitute; Children's homes, night shelters with community toilets.

For special categories States like Himachal Pradesh, the pattern of funding is 80% by Government of India, 10% by State Government and 10% by local Municipality.

Under JNNURM scheme, Shimla town has been covered for under taking different activities. These activities include setting up of Solid Waste Management Improvement of Shimla city; Rehabilitation of Water Supply Distribution System for Shimla city; Rejuvenation of Sewerage Network in missing lines and left out.

Rajiv Gandhi Urban Renewal Facility (RGURF): This scheme was launched in 2006-07 for infrastructure and sanitation improvement in all urban areas of the State other than Shimla. Main Objectives of the scheme is infrastructure and sanitation improvement in all urban areas of the State.

Components of the scheme are: Management of Urban Solid Waste; Parking lots within the towns for cars etc. and on the fringe of the town for trucks. The truck parking facilities shall also integrate the workshops, *dhabas* and other eateries, common civic amenities etc. The land for such parking lots shall have to be provided by the local bodies and the State Government shall not make any provision for cost of land; Setting up of new public amenities by way of community toilets within the existing towns, especially in the proximity of bus stands, hospitals, main shopping areas etc. the new community toilets shall be on a lease / contract basis with M/s Sulabh International who already has their presence in the State; Development of parks within the existing towns; The Urban Local Bodies shall get detailed project report prepared for each proposal. The cost of Detail Project Reports could also be an integral part of the overall project cost and its funding.

The funds will be provided to Municipal Council / *Nagar Panchayat* on "first come first served basis" as 95% Government Grant of total cost of DPR and remaining 5% is to be borne by Municipality out of its own resources under Rajiv Gandhi Urban Renewal Facility (RGURF) for infrastructure and sanitation improvement in urban areas. During current financial year 2010-11, there is a budgetary provision of Rs.671.00 *lakhs* under this scheme for infrastructure and sanitation improvement in urban areas.

Environmental Improvement of Urban Slums (E.I.U.S): Environmental Improvement of Urban Slums (E.I.U.S.)/ National Slum Development Programme (NSDP) was launched in Himachal Pradesh during 1982-83 and was being implemented by Town & Country Planning Department till 1998-99. The scheme had been transferred to the Directorate of Urban Development during the year 1999-2000 for further implementation. This programme falls under Special Component Plan (SCP) on which 50% budget is being utilized every year.

The aims and objective of the scheme is to improve the environmental condition of 2.50 *lakh* slum dwellers living in 374 slum pockets in 49 Urban Local Bodies of the State. This is being carried out by way of providing community facilities such as paths, drains, *raen baseras* (night shelters), toilets, street lights, parks, roads and storm water drains (gutters)

etc. to benefit the slum population of the Pradesh.

The State scheme shall be first get sanctioned in a State level project committee, which shall be set up for this purpose by the State Government concerned and shall have one representative from the Department of Urban Employment & Poverty Alleviation, which is the nodal Department for this scheme.

At district level, The Deputy Commissioner of the district, monitors quarterly progress under this programme; at State level, The State Government monitors the progress under this programme; and at National Level, The Department of Urban Employment and Poverty Alleviation of Government of India monitors the progress under this programme.

The funds for this scheme are being received through State Plan Budget under head 2217 Urban Development. The Social Justice and Empowerment Department has been declared as administrative Department for the implementation of these schemes under Scheduled Caste sub plan of State budget.

During the year 2009-10, Rs 244.00 *lakhs* were released to the ULBs under Environment Improvement of Urban Slum (EIUS) scheme to benefit 3300 BPL families by providing basic amenities and infrastructure, viz. community taps, hand pumps, street lights, community bathrooms and latrines, road pavements, sewerage and storm water drainage, *raen baseras* etc. in slum areas. There is a budget provision of Rs. 294.00 *lakhs* to benefit 3600 slum families in the current financial year 2010-11 under this scheme.

National Rural Employment Guarantee Scheme: The National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective w.e.f. 2nd February 2006. The focus of the scheme is on the following works in their order of priority: Water Conservation and Water Harvesting works; Drought proofing works (including afforestation and tree plantation); Irrigation canals including micro and minor irrigation works; Provision of irrigation facility, horticulture plantation and land development facilities on land owned by the households belonging to the Scheduled Castes and Scheduled Tribes or to Below Poverty Line families or to beneficiaries of land reforms or to the beneficiaries under the *Indira Awas Yojana* of the Government of India; Renovation of traditional water bodies including desilting of tanks; Land developments works; Flood control and protection works including drainage in water logged areas; Rural connectivity to provide all-weather access. Till September 2010, about 367 works have been completed, while 6840 works are in progress for land development.

National Highway Accident Relief Service Scheme (NHARSS): In order to provide immediate medical assistance to road accident victims and also to remove damaged vehicles from the site, cranes and ambulances are provided under this scheme to NGOs/State authorities. The recurring expenditure on account of operation and maintenance cost is to be borne by the beneficiary State Government/NGO.

National Biodiversity Action Plan, 2008: The National Biodiversity Action Plan (NBAP) is a framework for taking action by the multitude of stakeholders in biodiversity for achieving the three objectives of the Convention on Biological Diversity (CBD), namely conservation of biodiversity, sustainable use of its components, and fair and equitable sharing of benefits arising out of their use. The NBAP draws upon the main principle in the National Environment Policy that human beings are at the centre of sustainable development concerns and they are entitled to a healthy and productive life in harmony with nature.

Taking cognizance of the existing legislations, implementation mechanisms, strategies, plans and programmes, action points have been designed in the NBAP, so as to integrate

biodiversity concerns into various others sectors. NBAP is consistent with the ecological, social, cultural and economic mosaic of the country and provide focus and impetus to current efforts towards biodiversity conservation.

2.5 Mining & Geology

The policies and laws applicable and/or related to Mining sector of the State along with a brief description of their relevance are listed below. Detailed explanations can be acquired from the websites of relevant Departments, line Ministries like Ministry of Environment and Forests Government of India (www.envfor.nic.in), Ministry of Commerce and Industries, Government of India (http://commerce.nic.in/), Ministry of Mines, Government of India (http://mines.nic.in), and Himachal Pradesh Industries Department. (http://himachal.gov.in/industry/welcomelat.htm).

National Level Policies / Regulations

Constitution of India, Mineral Regulation: Ownership of the minerals rests with the State and the Central Government is required to regulate the mines and minerals development to the extent declared in accordance with Entry 54, Union List of the Seventh Schedule of the Constitution. The power of the States to regulate mines or minerals development is subject to Entry 23, List II State List in the Seventh Schedule.

National Mineral Policy (NMP), 2008: The new NMP enunciates measures like assured right to next stage mineral concession, transferability of mineral concessions and transparency in allotment of concessions, in order to reduce delays, which are seen as impediments to investment and technology flows in the mining sector in India. The Mining Policy also seeks to develop a sustainable framework for optimum utilization of the country's natural mineral resources for industrial growth in the country and, at the same time, improve the life of people living in the mining areas, which are generally located in the backward and tribal regions of the country. Salient features of the NMP are:

Minerals being a valuable resource, extraction has to be optimized through scientific methods, beneficiation and economic utilization. Zero waste mining will be the goal (para 2.1 of NMP); the duration of all concessions shall be rationalized (para 5.2 of NMP), a framework of sustainable development will be designed to ensure that mining can take place along with restoration (para 2.3 of NMP); mining shall not be undertaken in ecologically fragile or biologically rich areas. Mining in forest areas will be accompanied by time-bound reclamation (para 7.10 of NMP); special care will be taken to protect the interests of host and tribal populations (para 2.3 of NMP), project affected persons will be protected through comprehensive R&R packages (para 2.3 of NMP); old disused mining sites will be converted into forests or used in some other appropriate manner (para 7.10 of NMP); when mine closure becomes necessary, it should be orderly and systematic with rehabilitation of workers (para 7.12 of NMP); value addition will be encouraged, as also growth of mineral sector as a stand-alone industrial activity (para 2.4 of NMP). Mining as a backward linkage and value addition as a forward linkage within the State will be encouraged (para 7.4 of NMP); mining sectoral value addition through beneficiation, calibration, blending, sizing, concentration, pelletisation, purification and customization will be encouraged (para 7.2 of NMP); State agencies involved in mineral sector development and regulation will be encouraged to modernize in the areas of prospecting as well as regulation (para 2.6 of NMP); the State Directorates will be suitably strengthened to enable them to regulate mining in the interests of conservation and scientific development of the sector (para 2.2 of NMP); States will be assisted to overcome the problem of illegal mining through operational and financial linkages with IBM (para 2.6 of NMP);

mining of small deposits will be suitably regulated to promote scientific and efficient extraction and to control illegal mining. A cluster approach shall be encouraged through formation of consortia of small scale miners (para 7.9 of NMP); there will be arms length distance between State agencies that mine and those that regulate (para 4 of NMP); ore bodies shall be reserved for PSUs only, if there are no applications from private players for the area (para 4 of NMP) and use of machinery and equipment, which improve the efficiency, productivity and economics of mining operation and safety and health of workers and others shall be encouraged (para 7.5 of NMP).

The National Water Policy, 2002: In the planning and operation of systems, water allocation priorities should broadly include drinking water, irrigation, hydro-power, ecology, agro-industries and non-agricultural industries, navigation and other uses. However, the priorities could be modified or added if warranted by the area/region specific considerations.

National Policy on Resettlement and Rehabilitation, 2007: It is applicable when more than a defined number of families are displaced for a project. The threshold is 400 or more Displaced Families (DFs) en masse in plains and 200 DFs or more in tribal or hilly areas, Desert Development Programme (DDP) blocks or areas under Schedule V and VI to the constitution of India.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a Green India, (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

National Mission for Sustaining the Himalayan Ecosystem: The plan aims to conserve biodiversity, forest cover, and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply, are projected to recede as a result of global warming.

National Mission for a 'Green India': Goals under this Mission include the afforestation of six million hectares of degraded forest lands and expanding forest cover from 23 percent to 33 percent of India's territory.

The National Environment Policy (NEP), 2006: Section 5.1.3 Substantive Reforms of NEP states that Environmental Impact Assessment (EIA) will continue to be the principal methodology for appraising and reviewing new projects. The assessment processes are under major revision in line with the Govindarajan Committee recommendations. Under the new arrangements, there would be significant devolution of powers to the State/UT level. However, such devolution, to be effective, needs to be accompanied by adequate development of human and institutional capacities. Further, in order to make the clearance processes more effective, the following actions will be taken: Point (d) of Section 5.1.3 states "Encourage clustering of industries and other development activities to facilitate setting up of environmental management infrastructure as well as monitoring and enforcing environmental compliance. Emphasise post project monitoring and implementation of environmental management plans through participatory processes, involving adequately empowered relevant levels of Government, industry, and the potentially impacted community." Further, point g seeks to ensure provision for environmental restoration after decommissioning of industries, in particular mine closure, in all approvals of mining plans, and institutionalise a system of post-

monitoring of such projects.

Section 5.2.10 of NEP on Climate Change point (G) states, "Encourage Indian Industry to participate in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects, including in the financial sector."

Section 5.3.1 of NEP suggests following specific actions: a) Set up a permanent machinery comprising experts in all relevant disciplines to review notified ambient and emissions standards in the light of new scientific and technological information as they become available, and changing national circumstances, ensuring adequate participation by potentially impacted communities and industry associations. b) Strengthen the testing infrastructure and network for monitoring ambient environmental quality, including through participation by local communities and Public-Private Partnerships. Progressively, ensure real-time and on-line availability of the monitoring data.

Section 5.4 on Clean Technologies and Innovation suggests actions, like a) encourage capacity building in the financial sector for appraising clean technology switchover project proposals; b) set up a mechanism to network technology research institutions in the country, public and private, for cooperation in technology research and development and adaptation, information and evaluation of clean technologies. Create a database of such technologies and promote dissemination of new technologies developed both in India and abroad; c) consider use of revenue enhancing fiscal instruments to promote shifts to clean technologies in both existing and new units; and d) promote adoption of clean technologies by industry, in particular, in the small and medium industry sector, through regulatory and fiscal measures, and standards setting.

Section 5.6 on Partnerships and Stakeholder Involvement states, " Conservation of the environment requires the participation of multiple stakeholders, who may bring to bear their respective resources, competencies and perspectives, so that the outcomes of partnerships are superior to those of each acting alone." Implementing and policy making agencies of the Government, at Central, State, Municipal, and *Panchayat* levels; the legislatures and judiciary; the public and private corporate sectors; financial institutions; industry associations; academic and research institutions; independent professionals and experts; the media; youth clubs; community based organizations; voluntary organizations; and multilateral and bilateral development partners, may each play important roles in partnerships for the formulation, implementation, and promotion of measures for environmental conservation.

The following provisions are, accordingly made for review, updating, and renewal of the National Environment Policy by undertaking consultations every three years with groups of diverse stakeholders, i.e., researchers and experts, community based organizations, industry associations, and voluntary organizations, and update the National Environment Policy.

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralised public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions.

The policy hoped that the independently stated policies and programmes of the environment related sectors be smoothly interfaced with the policies and the programmes of the health sector, in order to reduce the health risks to the citizens and the consequential disease burden.

This policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognizes the significant contribution made by NGOs and other institutions of the civil society

in making available health services to the community. It also emphasizes the need to simplify procedures for Government – civil society interface in order to enhance the involvement of civil society in public health programmes.

Land Acquisition Act, 1894: Land requirements for mining activities and all their associated facilities can be significant. Land acquisition is being done under the Land Acquisition Act, 1894, amended in 1984. Historically, land for large mines has been acquired by the State. The land Acquisition Act, 1984 is currently being modified to link it with the Resettlement and Rehabilitation (R&R) policy. The draft version of the Act seeks to make resettlement and rehabilitation enforceable; includes livelihoods, habitats, cultural and natural resources as critical areas of impact to be compensated and addressed; and seeks modification of the clause of 'public purpose' for acquisition. It also provides for valuing land at replacement value and not market value, as is the status today.

Geographical Indications of Goods (Registration and Protection) Act, 1999 (No.48 of 99): It's an Act to provide for the registration and better protection of geographical indications relating to goods. The Act defines Geographical Indication in relation to goods. It means an indication, which identifies goods, such as agricultural goods, natural goods or manufactured goods as originating, or being manufactured in the territory of a country, or a region or locality in that territory, where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical origin and in case where such goods are manufactured goods, one of the activities of either the production or of processing or preparation of the goods concerned takes place in such territory, region or locality, as the case may be.

The Geographical Indications of Goods (Registration and Protection) Rules, 2002: The Rules define application for registration of a geographical indication that includes the geographical indication for goods contained in it. The Rules define procedure for geographical indication, which serves to designate the goods as originating from the concerned territory of the country or region or locality in the country, as the case may be, in respect of specific quality, reputation or other characteristics, which are due exclusively or essentially to the geographical environment, with its inherent natural and human factors, and the production, processing or preparation of which takes place in such territory, region or locality, as the case may be.

Explosives Act, 1884: The Act regulates the manufacture, possession, use, sale, (transport, import and export) of explosives. This Act was enacted to prevent accidents at various points of handling of explosives. It does not include any provision for prevention of crime involving explosives. The Act defines 'explosives' as any substance, whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous, used or manufactured with a view to produce a practical effect by explosion or pyrotechnic effect. The term includes gunpowder, nitroglycerine, detonators etc. as also fireworks and fog signals. The following rules have been framed under this Act.

Explosives Rules, 1983: The rules are framed under Section 5 and 7 of the Explosives Act, 1884 (4 of 1884) and extends to various compositions of explosives. The rules define 'authorised explosives' as explosives included in a list of authorised explosives published by the Central Government from time to time in the Official Gazette.

The rules have set safety distance categories of explosives, such as (1) Explosives are divided into four categories according to the risks, which they present when initiated, namely (i) Category X – Those explosives, which have a fire or a slight explosion risk or both, but the effect of which will be local; (ii) Category Y – Those explosives, which have a mass fire risk or a moderate explosion risk, but not the risk

of mass explosion; (iii) Category Z – Those explosives, which have a mass explosion risk and major missile effect; (iv) Category ZZ – Those explosives, which have a mass explosion risk and minor missile effect.

Notifications under the Explosives Act, 1884: The Notification no. M-1217, dated 20th November, 1926 was issued in exercise of the powers conferred by Section 17 of the Indian Explosives Act, 1884 (IV of 1884), and in supersession of the Commerce and Industry Department Notification No.12455, dated the 20th October, 1917, wherein the Governor-General-in-Council declared that picric acid, picrates and mixtures of picric acid shall be deemed to be explosives within the meaning of the said Act with exceptions.

Mines and Minerals (Development and Regulation) Act, 1957: Section 4A provides for powers to terminate lease holdings in case they are detrimental to environment due to mine operations and Section 18 provides for ensuring environment protection along with mineral development.

Gas Cylinder Rules, 1981: The Rules regulates possession, delivery, dispatch, handling, examination and testing of gas cylinders.

The Mines Act, 1952: It's an Act to amend and consolidate the law relating to the regulation of labour and safety in mines. It regulates aspects, like inspectors and certifying surgeons, mining operations and management of mines, health and safety, hours and limitation of employment, leave with wages, regulations, rules and bye-laws, penalties and procedures etc.

Mines and Minerals (Development and Regulation), Act 1957: It is applicable to all minerals. State Government has the power to grant mining lease of all mineral, except those specified minerals falling in the First Schedule of the Act and include Atomic minerals, Coal and Lignite and metallic and non-metallic minerals, like Iron Ore, Lead, Zinc, Gold, Copper Ore, Bauxite, Precious stones etc.

Mines and Minerals (Development and Regulation) Act, 2010: The Mines and Minerals (Development and Regulation) Act, 2010 is an Act to provide for the scientific development of mines and minerals under the control of the Union and the regulation of activities connected therewith.

The version of the draft Mines and Minerals Development Regulation Act, 2008 (3rd June, 2010 version) was referred to Group of Ministers (GoM) constituted vide Cabinet Secretariat Order No.381/3/2/2010-Cab dated 14th June 2010. The GoM has held three meetings so far on 22.7.2010, 30.7.2010 and 17.9.2010 and provisions of the draft have been subsequently modified in the light of feedback and representations received in this period. The provisions of the 3rdJune, 2010 draft do not, therefore, represent the current position, but only the last public version.

Updated Draft Mines and Minerals (Development and Regulation) Act (Ver. 03-06-10): Under this version, no person shall undertake any reconnaissance, prospecting, general exploration, detailed exploration or mining in respect of any major or minor minerals except under a reconnaissance licence, large area prospecting licence, prospecting licence or mining lease in case of a major minerals or any other mineral concession, in case of minor minerals, as the case may be, granted in accordance with the provisions of this Act and the rules made there under. Subsequently, two updated Draft Mines and Minerals (Development and Regulation) Act (Ver 08-01-2010) versions namely Mines and Minerals (Development and Regulation) Act (Ver. 31-03-2010) have been prepared.

Cess and Other Taxes on Minerals (Validation) Act, 1992: It's an Act to validate the imposition and collection of cesses and certain other taxes on minerals under certain State laws.

Mineral Concession Rules, 1960: It regulates grant of prospecting licences in respect of land in which the minerals vest in the Government; grant of mining leases in respect of land in which the minerals vest in the Government; procedure for obtaining a prosecuting licence or mining lease in respect of land in which the minerals vest in a person other than the Government; grant of prospecting licences and mining leases in respect of land in which the minerals vest partly in the Government and partly in Private persons.

Mineral Concession (Amendment) Rules, 2002: The amendment was made in Rule 14 of the Mineral Concession Rules, 1960 in sub-rule (1), in clause (i), for the words "being not less than fifty paise and not more than five rupees," the words "being not less than rupee one and not more than rupees ten" was substituted. In Rule 20 of the Principal Rules in sub-rule (1), for the words "a sum of five hundred rupees," the words "a sum of two thousand and five hundred rupees" was substituted. In Rule 22BB, of the Principal Rules, after sub- rule (1), the following sub-rule was inserted namely (1a) - Every mining plan submitted for approval under sub-rule (1) shall be accompanied with a non-refundable fee of one thousand rupees for every square kilometre or part thereof of mining area covered under the mining lease." In rule 24A of the Principal Rule, in sub-rule (3), the following provisos was inserted at the end, namely, "Provided that before granting approval for second or subsequent renewal of a mining lease, the State Government shall seek a report from the Controller General, Indian Bureau of Mines, as to whether it would be in the interest of mineral development to grant the renewal of the mining lease. Provided further that in case a report is not received from Controller General, Indian Bureau of Mines in a period of three months of receipt of the communication from the State Government, it would be deemed that the Indian Bureau of Mines has no adverse comments to offer regarding the grant of the renewal of mining lease.

Cement Cess Rules, 1993: Cement Cess Rules, 1993, Ministry of Industry (Department of Industrial Development), No. S.O 126(E), has been set up as required by Sub-section (1) of Section 30 of the Industries (Development and Regulation) Act, 1951 (65 of 1951). This rule defines the 'cess' as cess levied and collected in terms of Order No. S.O 125 (E) dated 24th February, 1993 of Department of Industrial Development, issued under Sub-section (1) Section 9 of the Act. Further, it defines 'cement' as any variety of cement manufactured in India, and includes Portland pozzolana cement, blast furnace slag cement, water-proof (hydrophobic) cement, rapid hardening cement, low heat cement, masonry cement, high strength ordinary Portland cement, oil-well cement and white cement. It also defines 'manufacturer' as any cement plant producing cement, excluding cement plants of capacity less than 99000 tonnes per annum based on rotary kiln and 66000 tonnes per annum based on vertical shaft kilns.

Notifications: G.S.R 153(E) Mines and Minerals Act, 1957, Dated- 04-03-05: The notification is for Mineral Concession (Second Amendment) Rules, 2005. Under Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), the Central Government has made rules to amend Mineral Concession Rules, 1960. The amendment is in rule 64D of the Mineral Concession Rules, 1960, under the heading 'Guidelines', for the word 'aluminium,' the following shall be inserted, namely: - "(bauxite and laterite dispatched for use in alumina and aluminium metal extraction);" (b) in the Explanation below Case 2, after the words aluminium, the following shall be inserted, namely: - "(bauxite and laterite dispatched for use in alumina and aluminium metal extraction);" (c) in the heading of Case 3, after the word 'aluminium', the following shall be inserted, namely "(bauxite and laterite dispatched for use in alumina and aluminium metal extraction)."

Notifications: G.S.R. 280 (E) Mines and Minerals Act, 1957, Dated- 05-05-05: The third amendment is made In the Mineral

Concession Rules, 1960, for rule 66A. Following rule has been substituted, namely: "66A. **Special provisions relating to atomic minerals:-** (1) Notwithstanding anything contained in these rules, the prospecting or mining operations in respect of atomic minerals listed in Part-B of the First Schedule of the Act shall be subject to following conditions, notably, if the holder of a prospecting licence or mining lease discovers any atomic mineral in the area granted under licence or lease, not specified in the licence or lease, discovery of such mineral shall also be reported to the Director, Atomic Minerals Directorate for Exploration and Research, Hyderabad within 60 days from the date of discovery of such mineral. Further, the licencee or lessee shall not win or dispose off such atomic mineral, unless such atomic mineral is included in licence or lease or a separate licence or lease for the purpose has been obtained; the quantities of atomic minerals recovered incidental to such prospecting or mining operations shall be collected and stacked separately and a report to that effect shall be sent to the Secretary, Department of Atomic Energy, Mumbai and the Director, Atomic Minerals Directorate for Exploration and Research, Hyderabad, every three months for such further action by the licensee or lessee as may be directed by the Atomic Minerals Directorate for Exploration and Research or the Department of Atomic Energy, and the licensee or lessee referred to in sub-rule (1) shall, within the period referred to therein, apply to the Secretary, Department of Atomic Energy, Mumbai, through the State Government, for grant of a licence to handle the said atomic minerals under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and the Department of Atomic Energy shall intimate the State Government regarding issue of licence provided that, if in the opinion of the Department of Atomic Energy, the atomic mineral or minerals recovered incidentally to such prospecting or mining operations is not of economically exploitable grade or the quantity found is insignificant, it may advise the State Government to exempt the licensee or lessee from obtaining a separate licence or lease for/or inclusion of the atomic minerals under these rules."

Notifications: G.S.R.49 (E) Mines and Minerals Act,1957, January 05: In exercise of the powers conferred by Section 13 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), the Central Government made the following rules further to amend the Mineral Concession Rules, 1960, namely Mineral Concession (Amendment) Rules, 2005. In rule 22 D of the Mineral Concession Rules, 1960, provision has been added, namely, **"**Provided that in the case of renewal of mining lease, the restrictions of minimum area for grant of mining lease shall not be applicable."

Notifications: G.S.R.833 (E) Mines and Minerals Act, 1957, Dated- 21-10-03: In the Schedule of the Mineral Conservation and Development Rules, 1988, (a) In Form H-1, in PART-IV (General Geology and Mining), in serial number 4, for the words, "Reserves and Resources estimation during the year," the following words has been substituted, namely:- "Reserves and Resources estimated at the end of the year." (b) In Form H-9, in PART-IV (General Geology and Mining), in serial number 2, for the words, "Reserves and Resources estimation during the year," the following words have been substituted, namely "Reserves and Resources estimated at the end of the year."

Notification G.S.R. 963 (E): In exercise of the powers conferred by Section 18 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), the Central Government, hereby, made the following rules further to amend the Mineral Conservation and Development Rules, 1988, namely: (1) These rules may be called the Mineral Conservation and Development (Fourth Amendment) Rules, 2003. In rule 23B of the Mineral Conservation and Development Rules, 1988 in sub-rule (2), for the words, "Within a period of one hundred and eighty days from the date of commencement of this rule," the following

words shall be substituted, namely "on or before the 31st December, 2004."

Notifications on Labour and Safety in Mines include the following:

The Mines Act, 1952: It seeks to regulate the working conditions in mines by providing measures to be taken for the safety of the workers employed therein. To ensure the implementation of the Mines Act, 1952, the Union Legislature has framed the Mines Rules, 1955, Metalliferous Mines Regulations, 1961, and the Maternity Benefit (Mines) Rules, 1963 etc. The Mines Act prescribed duties of the owner (defined as the proprietor, lessee or an agent) to manage mines and mining operations and the health and safety in mines. It also prescribes the number of working hours in mines, the minimum wage rates, and other related matters.

The Mines Rules, 1955: It describes the procedural aspects. Both penal and pecuniary punishments are prescribed for contravention of obligation and duties under the Act.

The Metalliferous Mine Regulation, 1961: It provides for the certification of competency and fitness for the mine managers and engineers, supervisory staff, foreman, and surveyors. The regulation also prescribes the types of mining plans; the types of survey and mining instruments to be used; the equipment used for access and egress of workers to the mines; and transportation of men, minerals, and other related matters.

Mineral Concession Rules, 1960: Section 22(5) states that mining plan shall incorporate environmental assessment and management.

Mineral Conservation and Development Rules, 1958: The provisions of these rules are enforced by Indian Bureau of Mines, Government of India and include enforcement, conservation and systematic development of major mineral resources, through implementation of mining plans etc.

Mineral Conservation and Development Rules, 1988: Chapter 5 covers the Environmental protection issues comprehensively. Mining plan format prescribed by Indian Bureau of Mines under Mineral Conservation and Development Rules, 1988 for Environment Management Plan requires that a five year rolling plan is presented.

The Mines Rules, 1955 and The Indian Metalliferous Mines Regulation, 1961: These are being enforced by the Government of India through the Director General of Mines Safety (DGMS) under the Union Ministry of Labour and take care of safety, welfare, working conditions in mines for both major and minor minerals.

Mineral Concession Rules, 1960: It is applicable to all major minerals *i.e.* industrial minerals except minor minerals. The rules define procedure for grant of prospecting license, mining lease, areas and period of lease, payment of royalties etc.

Environment Impact Assessment (EIA) Notification, September 14, 2006: Undertaking mine level EIA and formulating Environment Management Plan (EMP) are mandatory for seeking Environmental Clearance (EC) under EIA Notification, 2006. Mining projects that have a lease area of more than 50 hectares in size are classified under Category A and need Environmental Clearance (EC) from National level Environmental Impact Assessment Authority created with MoEF in Government of India. Mining projects that have a lease area between 5 to 50 hectares are classified as Category B projects and require Environmental Clearance from State Environment Impact Assessment Authority (SEIAA) created with respective State Department of Environment in the State Government. Mine leases smaller than five hectares in size are not covered under the EC process initiated by EIA Notification, 2006.

The projects/activities listed for prior environment clearance included in the said

Notification are: 1. Mining, extraction of natural resources and power generation (for a specified production capacity), such as Mining of minerals, Offshore and onshore oil and gas exploration, development and production, River Valley Projects, Thermal Power Plants, Nuclear Power Projects and processing of nuclear fuel. 2. Those that come under Primary Processing are Coal washeries, Mineral beneficiation. 3. Materials Production includes Metallurgical industries (ferrous and non ferrous), Cement plants. 4. Materials processing includes petroleum refining industry, Coke oven plants, Asbestos milling and asbestos based products, Chlor-alkali industry, Soda ash Industry, Leather / skin / hide processing industry. 5. Manufacturing / Fabrication are Chemical fertilisers, Pesticides industry and pesticide specific intermediates (excluding formulations), Petro-chemical complexes (industries based on processing of petroleum fractions and natural gas and/or reforming to aromatics), Manmade fibres manufacturing, Petrochemical based processing (processes other than cracking and reformation and not covered under the complexes), Synthetic organic chemicals industry (dyes and dye intermediates, bulk drugs and intermediates excluding drug formulations, synthetic rubbers, basic organic chemicals, other synthetic organic chemicals and chemical intermediates), Distilleries, Integrated paint industry, Pulp and paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching, Sugar Industry, Induction/arc furnaces/cupola furnaces 5TPH or more. 6. Service Sectors are Oil and Gas transportation pipe line (crude and refinery/petrochemical products), passing through national parks/sanctuaries/ecologically sensitive areas including LNG Terminal, Isolated storage and handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 and 3 of MSIHC Rules, 1989, amended 2000). 7. Physical Infrastructure including Environmental Services are Air ports, Industrial estates/parks/complexes/areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes, Common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) and Common Effluent Treatment Plants (CETPs).

The said notification has set Specific Condition (SC) for appraisal of Industrial projects for Environmental Clearance, which are: "If any Industrial Estate/Complex/Export Processing Zones/Special Economic Zones/Biotech Parks/Leather Complex with homogeneous type of industries, such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre–defined set of activities, (not necessarily) homogeneous, obtains prior Environmental Clearance, individual industries including proposed industrial housing within such estates/complexes will not be required to take prior Environmental Clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates / complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior Environmental Clearance, who may be held responsible for violation of the same throughout the life of the complex/estate)."

Environment Impact Assessment (EIA) Notification dated 14th September,2006– Clarification regarding EIA Clearance for Change in Product-Mix: The MoEF had issued Interim Operational Guidelines on 13th October, 2006. Further to these Guidelines, the following clarification was issued for Environment Clearance for the category of products involving change in Product Mix. It clarifies that (1) in cases of change in Product Mix, changes in the quantities or numbers of products may be allowed without prior Environmental Clearance by the concerned State Pollution Control Board, provided such changes in the quantities of products are in the same category and are within the previously granted overall total limits; and (2) projects involving modernisation of the existing unit with increase in the total production capacity beyond the threshold limit specified in the

Schedule to the Notification, through change in process or technology or change in the Product Mix or debottle-necking or a combination of these, involving increase in pollution load will obtain prior Environment Clearance from the concerned regulatory authority under the EIA Notification, 2006. MoEF Circular vide file no J- 13011/81/2006-IA II (I), dated 6th February, 2007, clarified regarding consideration of integrated projects for Environment Clearance by Expert Appraisal Committee. It states that Industry projects with mining component will be considered by the 'Industry Committee' and stand alone mining projects will be considered by 'Mining Committee'.

The Environment (Protection) Act, 1986: It is a comprehensive legislation on environment that empowers the Central Government to take appropriate measures for the purpose of protecting and improving the environment. It provides for laying down standards for controlling emissions and effluent discharges of environmental pollutants; to regulate industrial locations; to prescribe procedures for managing hazardous substances; to establish safeguards for preventing accidents; and to collect and disseminate information regarding environmental pollution. In accordance with this Act, the Central Government has issued a number of regulations affecting sectors, such as hazardous and chemical wastes, genetically engineered microorganisms and industrial development of coastal zones.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment (Protection) Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Environment (Siting for Industrial Projects) Rules, 1999, Environment (Protection) Act, 1986: Under clause (v) of Sub-section (2) of Section 3, Sub-section (1) of Section 6 and Section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with Rule 5 of the Environment (Protection) Rules, 1986, the Central Government made Rules for Siting Industrial Projects, namely Environment (Siting for Industrial Projects) Rules, 1999. The said Rule prohibits setting up of certain industries**.** It specifies four conditions, namely, (a) No new unit of the industries listed in Annexure-I shall be allowed to be set up in the entire area within the municipal limits of all Municipal Corporations, Municipal Councils and *Nagar Panchayats* (by whatever name these are known in each State) and a 25 kms belt around the cities having population of more than one million. (b) Seven kms belt around the periphery of the wetlands listed in Annexure-II. It is to be noted that no wetland in Himachal Pradesh is listed in Annexure II. (c) 25 kms belt around the periphery of National Parks, Sanctuaries and core zones of Biosphere Reserves; and (d) 0.5 km wide strip on either side of National Highways and rail lines.

The rules provides for establishment of New Units with certain conditions: Establishment of new units of the industries listed in Annexure-I shall be allowed in 7 to 25 kms belt around the periphery of the wetlands listed in Annexure-II only after careful assessment of their adverse ecological and environmental impacts. Further Rules provide for establishment of New Units around Archaeological Monuments. It stipulates that new units of industries listed in Annexure-III shall not be allowed to be set up within 7 kms. periphery of important archaeological monuments listed in Annexure-IV. No monument from Himachal Pradesh is listed in Annexure IV.

The Forest (Conservation) Act, 1980: The Forest (Conservation) Act, 1980 as amended in 1988, checks the indiscriminate diversion of forest land for non-forest purposes. It primarily deals with discouraging the diversion

of forest lands for non-forestry purpose, mainly industry and mining. It requires State Governments to acquire the approval of the Central Government before it denotifies any forest, leased forest land to a private person or corporation, or clears it, even for the purpose of reforestation.

Prior clearance of projects requiring diversion of forests for non- forest purpose is needed under the Forest (Conservation) Act, 1980. The State Governments/Union Territories are required to submit formal proposals to the Central Government (Ministry of Environment and Forests) for diversion of forest land for non-forest purposes in the prescribed proforma along with details, such as flora, fauna, map of the area, compensatory afforestation proposed etc. Therefore, as far as possible, non-forest land should be selected for projects.

As per the amended Forest (Conservation) Rules, 2004 in force now, the Regional Chief Conservator of Forests has the powers to decide proposals involving forest land upto five hectares. Proposals involving forest land between 5 - 20 hectares shall be processed by the Regional Chief Conservator in consultation with a State Advisory Group consisting of representatives of the concerned State Government. Proposals involving more than 20 hectares of forest land are required to be placed before the Advisory Committee constituted by the MoEF, Government of India

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Some important guidelines laid down in the Forest (Conservation) Act, 1980 and Rules, 1981 for diversion of forest land for non-forest purposes as may be relevant for Himachal Pradesh are given below.

- These guidelines ensure that ecological considerations are in no way undermined while examining investment proposals. The State Government or the union territory administration concerned is required to envisage at the initial stage itself, the different likely impacts of the proposed project, starting with the proposed site. The guidelines specify certain criteria for the siting of an industry. It states that no projects should be in the vicinity of National Parks, Wildlife Sanctuaries and Core areas of the Biosphere Reserves. Further, the project needs to consider scenic landscapes, areas of geo-morphological significance, unique and representative biomes and eco-systems, heritage sites/structures and areas of cultural heritage and importance. It also includes fragile eco-systems, such as mountains, areas rich in coral formations as well as desert, wetland, riverine and eco-systems; and areas rich in biological diversity, gene pool and other natural resources.
- Investors in industrial projects involving forest land are required to undertake detailed Environmental Impact Assessment Studies of their projects with respect to physical resources, hydrology and water quality, socio-economic aspects, human use values etc.
- Besides forest lands, diversion of prime agricultural lands for non-forest purposes are also restricted.
- Investigations and surveys carried out in connection with hydro-electric projects, transmission lines, seismic surveys, exploration for oil drilling or mining will not attract the provisions of the Forest Act; provided these surveys are restricted to only clearing of bushes and lopping of tree branches and do not involve clearing of forests or cutting of trees.
- Such surveys, investigations and explorations are prohibited in Sanctuaries, National Parks, Biosphere Reserves and in the preservation and sample plots under the Wildlife (Protection) Act, 1972.
- The permission to survey, explore or prospect does not imply any commitment on the part of the Central Government for any subsequent use of the forest land.

The Environment (Protection) Fifth Amendment Rules, 2008: The Rules defined parameters for emissions from Common Hazardous Waste Incinerator namely

Particulate matter, HCl, SO_2, CO, Total Organic Carbon, HF, NOx (NO and NO_2 expressed as NO_2), Total dioxins and furans, Cd + Th + their compounds, Hg and its compounds, Sb + As + Pb + Co + Cr + Cu + Mn + NI + V + their compounds.

Environment (Protection) Seventh Amendment Rules, 2008: The amendment sets emission standards for incinerator for pesticide industry, namely, Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans (Existing Incinerator and New Incinerator), Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + and their compounds.

The amendment sets standards for wastewater as following: (i) Wastewater (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollutions (Part A: Effluents) notified under the Environment (Protection) Rules, 1986. (ii) The built up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/I over and above the TDS of raw water used.

Environment (Protection) Eighth Amendment Rules, 2008: The amendment is made in the Environment (Protection) Rules, 1986, in Schedule I (a) in serial number 94 relating to 'Noise Limit for Generator Sets Run with Diesel', in paragraph 3.2. (i) for the words every manufacturer or importer (hereinafter referred to as 'supplier'), every manufacturer or assembler or importer (hereinafter referred to as the 'manufacturer') shall be substituted; (ii) for the words 'manufactured or imported', the words 'manufactured or assembled or imported' shall be substituted.
Transportation of Diesel Generator Sets (above 250 KVA):

a. Diesel Generator set shall be transported after fulfilling the requirement of certification specified in paragraph 3.2 as a complete unit with acoustic enclosure, or dismantled, with relevant genset number specified on acoustic enclosure and silencer for reassembling at the site of its operation.
b. Compliance with the noise norms shall be monitored after reassembling the D.G. set at the location of the installation by the concerned State Pollution Control Board or, as the case may be, by the Union Territory Pollution Control Committee.

Environment (Protection) Second Amendment Rules, 2009: The amendment is made in the Environment (Protection) Rules, 1986 in Schedule I in serial number 73 relating to Pharmaceuticals Industry (Bulk Drugs). The Rules define:

Parameters for emission from Incinerator, namely, Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans, Existing Incinerator, New Incinerator Sb + As + Cr + Cp + Ci + Mo + V + Cd + Th + Hg and their compounds.

Parameters for effluent from Incinerator (i) Effluent from scrubber(s) and floor washing shall flow through closed conduit/pipe network. (ii) Storm water shall not be allowed to mix with scrubber water and or floor washings. (iii) Storm water shall be channelised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall. (iv) The build up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/l over and above the Total Dissolved Solids of raw water used. (v) Effluent shall not be stored in holding tank(s) in such manner, which may cause pollution to groundwater. (vi) Effluent (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollutions (Part A: Effluents) notified under the Environment (Protection) Rules, 1986.

Environment (Protection) Amendment Rules, 2009: In the Environment (Protection)

Rules, 1986, amendment is made in Schedule I, for Refractory Industry. The Rules define:
A. Emission Standards for (i) Down Draft Kiln Category, namely, Particulate matter and Stack height (ii) Other than (Fuel: Coal) Particulate matter, Stack height, (iii) Box, Tunnel, Down Draft Kiln etc. (Fuel: Natural Gas/Producer Gas/LPG or a combination of Fuels/Furnace Oil as Secondary Fuel), Particulate matter, Stack height, (iv) Rotary Kiln Category, Particulate matter, Stack height, Small medium large category, Small rotary kiln medium kiln large rotary kiln.

Effluent Standards for pH, Oil and grease, Biochemical Oxygen Demand (3 days, 27 degrees), Chemical Oxygen Demand, Suspended Solids, phenols, Cyanide as CN, Cr (hexavalent) and Cr (total) for Inland surface water, public sewer and land for Irrigation.

Environment (Protection) (Sixth Amendment) Rules, 2010: The Rules regulate (a) Iron Ore Mining and Ore Processing and set emission Standards for Stack for De-dusting Unit Particulate matter Stack height; (b) Fugitive Emission Standards for Particulate matter. Fugitive emission shall be monitored in the predominant downwind direction at a distance 25.0 + 2.0 metres from the source of fugitive emission as per following:
Area: Mine face/Benches and monitoring location, namely: drilling, excavation and loading applicable for operating benches above water table,
Area: Haul Roads/Service Roads and monitoring location, namely: haul roads to ore processing plant, waste dumps and loading areas and service road
Area: Crushing plant and monitoring location, namely: run-off mine unloading at hopper, crushing areas, screens and transfer points.
Area: Screening Plant and Monitoring location, namely: screens, conveying and transportation of ore discharge points.
Area: Ore Storage and Loading and Monitoring location, namely: intermediate stock bin/pile areas, ore stock bin/pile areas, wagon/truck loading areas.
Area: Waste dump and Monitoring location, namely: active waste /reject dumps
C. Effluent Standards defined for pH, Suspended solids (non-rainy day), Suspended solids (rainy day), and Oil and grease.

Environment (Protection) Second Amendment Rules, 2010: The amendment in the Rules regulates Plaster of Paris Industry. A Production Capacity upto 30 tonnes per day (tpd), Stack Emission Standards defined for particulate matter from Crusher, Calciner, Furnace and Grinder. Production Capacity above 30 tonnes per day (tpd), Stack Emission Standards defined for Particulate matter from Crusher, Calciner, Furnace and Grinder,

Environment (Protection) Third Amendment Rules, 2010: The amendment is made for serial number 8 and the entries relating thereto. The following serial number and entries shall be substituted, namely, the Dye and Dye Intermediate Industry.
A. Effluent Standard Parameters pH, Suspended Solids, Biochemical Oxygen Demand (3 days, 27°C Temperature), Colour, Mercury (as Hg), Chromium (as Chromium Hexavalent), Chromium (Total Chromium as Cr), Copper (as Cu), Zinc (as Zn), Nickel (as Ni), Lead (as Pb), Manganese (as Mn), Cadmium (as Cd), Chloride (as Cl), Sulphate (as SO_4), Phenolic Compounds (as C_6H_5OH), Oil and Grease and Bioassay Test.

B. Emission Standard Parameters for Incinerator namely Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans.
Existing Incinerator/New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds.

C. Effluent Standards for Incinerator

(i) Effluent from scrubber(s) and floor washing shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mentioned in 'A' above.

(ii) The built up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/l over and above the Total Dissolved Solids of raw water used.

D. Storm water

(i) Storm water shall not be allowed to mix with scrubber water and/or floor washings.
(ii) Storm water shall be channelised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

Environment (Protection) Fourth Amendment Rules, 2009: This amendment is made in the Environment (Protection) Rules, 1986, in Schedule I, for serial number 74, relating to 'Emission Standards for Brick Kilns' and entries relating thereto, the following serial number and entries shall be substituted, namely- Brick Kilns' emission standard for i) Bull's Trench Kiln (BTK) for Particulate matter, Stack height, (ii) Down Draft Kiln (DDK) Particulate matter and Stack height, (iii) Vertical Shaft Kiln (VSK) Particulate matter and Stack height.

Environment (Protection) Fourth Amendment Rules, 2010: This amendment is made in the Environment (Protection) Rules, 1986, in Schedule-I, in serial number 68 and the entries relating thereto, the following serial number and entries shall be substituted, for Organic Chemicals Manufacturing Industry Effluent Standards.

A. Effluent standards Parameters: pH, Biochemical Oxygen Demand (3 days, 27ºC), Oil & Grease Bioassay test + Nitrate (as N), Arsenic (as As), Chromium (Hexavalent), Chromium Total, Lead (as Pb), Cyanide (as CN), Zinc (as Zn), Mercury (as Hg), Copper (as Cu), Nickel (as Ni), Phenolics (as C_6H_5OH) and Sulphide.

B. Emission Standards for Incinerator: Limiting concentration in mg/Nm3, unless otherwise stated, Particulate Matter, HCl, SO_2 CO Total Organic carbon, Total Dioxins Existing, and Furans* Incinerator, New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds.

C. Effluent Standards for Incinerator: (i) Effluent from scrubber(s) and floor washing shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mentioned in 'A' above, (ii) the built up in Total Dissolved Solids (TDS) in waste water of floor washings shall not exceed 1000 mg/I over and above the Total Dissolved Solids of raw water used.

D. Storm water (i) Storm water shall not be allowed to mix with scrubber water and/or floor washings. (ii) Storm water shall be channellised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

Environment (Protection) Fifth Amendment Rules, 2010: The amendment in the Environment (Protection) Rules, 1986, is made in Schedule I at serial number 55 relating to Common Effluent Treatment Plants: B. Treated Effluent Quality of Common Effluent Treatment Plant, at parameter relating to 'Oil and Grease' (Concentration in mg/l) for disposal into Marine Coastal areas, for the figure "20", the figure "10" shall be substituted. Further, the amendment is made in Schedule VI relating to General Standards for Discharge of Environmental Pollutants, Part A: Effluents, at serial number 7, at parameter relating to 'Oil and Grease' (mg/I max.), in column number 3(d), for the figure "20", the figure "10" shall be substituted.

Energy Conservation Act, 2001: According to this Act, usage of energy should be kept at minimum both at the point of generation as well as on the point of application. These include short term as well as long term measures. The short term measures include: energy conservation, energy audit of

Government buildings and capacity building amongst Departments to take up energy efficiency programmes. The long term measures include; industry specific task forces, notifying more industries as designated consumers, conduct of energy audit amongst notified designated consumers, recording and publication of best practices (sector wise), development of energy consumption norms and monitoring of compliance with mandated provision by designated consumers.

Wildlife (Protection) Act, 1972: The Government of India enacted Wild Life (Protection) Act, 1972 with the objective of effectively protecting the wildlife and to control poaching, smuggling and illegal trade in wildlife and its derivatives. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent. The Ministry of Environment and Forests has proposed further amendments in the law by introducing more rigid measures to strengthen the Act. The objective is to provide protection to the listed endangered flora and fauna and ecologically important protected areas.

The Public Liability Insurance Act, 1991: After the Bhopal Gas Leak Tragedy, the Parliament enacted the Act called 'The Public Liability Insurance Act, 1991'. Section 2 defines 'accident' to mean an accident involving a fortuitous or sudden or unintended occurrence, while handling any hazardous substance resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property, but does not include an accident by reason only of war or radioactivity. The Act provides for the owner to take out insurance policies, the procedure for making application for relief and the award of relief. Section 13 empowers the Central Government or any person authorised by that Government on its behalf when it has reason to believe that any owner has been handling any hazardous substance in contravention of any of the provisions of the Act, that Government or, as the case may be, that person may make an application to a court, not inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of first class for restraining such owner from such handling. The other provisions of the Act are regarding penalties, offences by Companies, offences by the Act in 1992, which, inter alias, provides for establishment of Environmental Relief Fund. Section 7-A provides that the Central Government may, by notification, establish a fund to be known as the Environmental Relief Fund.

National Environment Tribunal Act, 1995: This Act provides for liability for damages arising out of any accident occurring while handling an hazardous substance and for the establishment of a National Environment Tribunal for effective and expeditious disposal of cases arising from such accident, with a view to give relief and compensation for damages to persons, property and the environment and for matters connected with or incidental thereto. The term 'accident' has been defined to mean accident involving a fortuitous or sudden or unintended occurrence while handling any hazardous substance resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property or environment, but does not include an accident by reason only of war or radio-activity.

A newly added Section 17-A to the said Central Act provides that the Central Government, with a view to conserving any mineral and after consultation with the State Government, may reserve any area not already held under any prospecting license or mining lease and, where it proposes to do so, it shall, by notification in the official Gazette, specify the boundaries of such area and the mineral or minerals in respect of which such area will be reserved.

The Central Government enacted the Mineral Conservation and Development Rules, 1888 under Section 18 of the Mines and Minerals (Regulation and Development) Act, 1957. Rule

4 provides that every holder of prospecting license shall submit to the Controller General and that every holder of prospecting license shall submit to the Controller General and the Regional Controller, or the authorised officer within a period of 60 days from the date of execution of the prospecting license, a scheme of prospecting, indicating the manner in which he proposes to carry out the prospecting operations in the area covered by the license. Rule 9 requires submission of mining plan and the mining operation is to be carried out in accordance with this plan.

Chapter-V of the Rules deals with environment, providing for taking all possible precautions for the protection of environment and control of pollution while conducting prospecting, mining, beneficiation or metallurgical operations in the area. The Rules also provide for removal and utilisation of top soil, storage of overburden, waste, rock etc. reclamation and rehabilitation of lands, taking precautions against air pollution, taking precautions with regard to discharge of toxic liquid, taking precaution against noise and restoration of flora.

The Parliament has also enacted the Mines Act, 1952 and Mines Rules have also been framed called the Mines Rules, 1955. The aforesaid Act and Rules along with the Metalliferous Mines Regulations, 1961, enacted under Section 57 of the Mines Act provide for scientific mining.

National Environmental Appellate Authority Act, 1997: National Environmental Appellate Authority Act, 1997 provides appellate forum for cases relating to site restrictions, development schemes and projects so as to balance development and environment.

Factories Act, 1948: The Act defines 'factory' as any premises including the precincts thereof - (i) whereon ten or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or (ii) whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines 'hazardous process' as any process or activity in relation to an industry specified in the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would - (i) cause material impairment to the health of the persons engaged in or connected therewith, or result in the pollution of the general environment, whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines manufacturing process as any process for - (i) making, altering, repairing, ornamenting, finishing, packing, oiling, washing, cleaning, breaking up, demolishing, or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal, or (ii) pumping oil, water, sewage or any other substance; or (iii) generating, transforming or transmitting power; or (iv) composing types for printing, printing by letter press, lithography, photogravure or other similar process or book binding; (v) constructing, reconstructing, repairing, refitting, finishing or breaking up ships or vessels; (vi) preserving or storing any article in cold storage.

It defines worker as a person employed, directly or by or through any agency (including

a contractor), with or without the knowledge of the principal employer, whether for remuneration or not, in any manufacturing process, or in cleaning any part of the machinery or premises used for a manufacturing process, or in any other kind of work incidental to, or connected with, the manufacturing process, or the subject of the manufacturing process, but does not include any member of the armed forces of the union.

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006: It establishes a process by which forest dwelling and other forest dependent communities can claim and get their rights settled on designated forest land. A number of projects, including mining projects, are being asked to investigate forest rights, even in cases of some, who have already received forest clearance and environmental clearance.

The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

The Noise Pollution (Regulation and Control) Rules, 2000: The Rules are framed with the objective of maintaining the Ambient Air Quality Standards in respect of noise and in view of increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices that have deleterious effects on human health and the psychological well being of the people. The Rules define 'area/zone' as all areas, which fall in either of the four categories given in the Schedule annexed to these rules, namely, Industrial area, Commercial area, Residential area and Silence Zone. The Act defines 'person' in relation to any factory or premises as a person or occupier or his agent, who has control over the affairs of the factory or premises.

The Rules define Ambient Air Quality Standards in respect of noise for different areas/zones. It made provision for the State Government to categorise the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas.

The Rules dated 14th February 2000 have been amended vide Notification S.O. 1046 (E) dated 22nd November, 2000. These rules are called the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000. The amendment defines authority as any authority or officer authorised by the Central Government, or as the case may be, the State Government in accordance with the laws in force and includes a District Magistrate, Police Commissioner, or any other officer not below the rank of Deputy Superintendent of Police designated for the maintenance of Ambient Air Quality standards in respect of noise under any law for the time being in force. The amendment also defines 'Silence zone' as an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area, which is declared as such by a competent authority.

The Noise Pollution (Regulation and Control) Rules, 2000: Noise pollution includes "fire crackers, sound producing instruments", besides "construction activity". In sub-clause (ii), for the words, "public

address system, appliances or apparatus", the words "public address system, horn, appliances or apparatus" have been substituted.

Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O 1088 (E), dated 11th October 2002. The amendment directs the State Government to reduce noise pollution, permit use of loud speakers or public address systems during night hours (between 10.00 p.m. to 12.00 midnight) on or during any cultural or religious festive occasion of a limited duration not exceeding fifteen days in all during a calendar year.

Amendment vide S.O. 1569 (E), dated 19th September 2006 provides directions for the State Pollution Control Board (in consultation with Central Pollution Control Board) for collection, compilation, and publication of technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.

The Noise Pollution (Regulation and Control) (Amendment) Rules, 2009: The Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, vide Notification 11th January, 2010. The amendment in Rule 5 provides for restrictions on the use of horns, sound emitting construction equipments and bursting of fire crackers. Further, sound emitting construction equipments shall not be used or operated during night time (defined as period between 10:00 PM-6:00 AM) in residential areas and silence zones.

Hazardous Wastes (Management and Handling) Rules, 2008: Ministry of Environment and Forests has notified the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 repealing earlier rules so as to make the Rules more practical and effective in implementation. The National Hazardous Waste Management Strategy is being finalised for effective management of hazardous wastes so as to avoid environmental pollution and adverse effects due to improper handling and disposal. A coordination mechanism for effective implementation of Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 by the custom authorities at the ports has been established.

The Workmen's Compensation Act, 1923: It's an Act to provide for the payment by certain classes of employers to their workmen of compensation for injury by accident.

The Industrial Disputes Act, 1947 (Act No. 14 of 1947): It's an Act to make provision for the investigation and settlement of industrial disputes, and for certain other purposes.

The Act defines 'industry' as any systematic activity carried on by co-operation between an employer and his workmen (whether such workmen are employed by such employer directly or by or through any agency, including a contractor) for the production, supply or distribution of goods or services with a view to satisfy human wants or wishes (not being wants or wishes, which are merely spiritual or religious in nature), whether or not, (i) any capital has been invested for the purpose of carrying on such activity; or (ii) such activity is carried on with a motive to make any gain or profit, and includes (a) any activity of the Dock Labour Board established under section 5A of the Dock Workers (Regulation of Employment) Act, 1948 (9 of 1948); (b) any activity relating to the promotion of sales or business or both carried on by an establishment. The Act defines industrial dispute as any dispute or difference between employers and employers or between employers and workmen, or between workmen and workmen, which is connected with the employment or non-employment or the terms of employment or with the conditions of labour, of any person.

The Contract Labour (Regulation and Abolition) Act, 1970 (Act No. 37 of 1970): An Act to regulate the employment of contract labour in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith. It applies to every establishment in which twenty or more

workmen are employed or were employed on any day of the preceding twelve months as contract labour and to every contractor, who employs or who employed on any day of the preceding twelve months twenty or more workmen. The Act defined 'workman' as deemed to be employed as 'contract labour' in or in connection with the work of an establishment when he is hired in or in connection with such work by or through a contractor, with or without the knowledge of the principal employer. Further, 'contractor' is defined, in relation to an establishment, as a person, who undertakes to produce a given result for the establishment, other than a mere supply of goods or articles of manufacture to such establishment, through contract labour or, who supplies contract labour for any work of the establishment and includes a sub-contractor.

This Act provides for the Prevention and Control of Water Pollution and for maintaining or restoring of wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act, Prevention and Control of Water Pollution, deals with: Power of the State Government to restrict the application of the Act to certain areas; Power to obtain information; Power to take sample of effluents and procedures to be followed; Reports of the result of analysis on samples taken under section; Power of entry and inspection; Prohibition on use of stream or well for disposal of polluting matter etc; Restrictions on new outlets and new discharges; Provision regarding existing discharge of sewage or trade effluent; Refusal or withdrawal of consent by State Board; Appeals; Revisions; Power of State Board to carry out certain works; Furnishing of information to State Board and other agencies in certain cases; Emergency measures in case of pollution of stream or well; Power of Board to make application to courts for restraining apprehended pollution of water in streams or wells and Power to give directions.

The Air (Prevention and Control of Pollution) Act, 1981 (as amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings on living creatures or plants or property or environment.

Industries Development and Regulation Act, 1951 (Act No. 65 of 1951): It's an Act to provide for the development and regulation of certain industries**.** The Act has provision for imposition of cess on scheduled industries in certain cases - (1) They may be levied and collected as a cess for the purposes of this Act on all goods manufactured or produced in any such scheduled industry, as may be specified on this behalf by the Central Government, by notified order, a duty of excise at such rate as may be specified in the notified order and different rates may be specified for different goods or different classes of goods.

State Level Policies / Regulations

Mining Policy: (i) The first Mining Policy of the State was spelled out on 2/9/1986. Its salient features included that no permit is required by traditional *Kumhars*. Permit can be given by *Gram Panchayat* without charging any fee/royalty for personal bonafide use for repair/construction of house for specified quantity; auction of slate quarries for five years and renewal with 25 percent annual increase; auction of river beds shall only be conducted after obtaining No Objection Certificate from

Executive Engineer, Department of Irrigation & Public Health etc.

(ii) Mining Policy dated 23-12-1998: The Policy dated 2nd September 1986 was partially modified by the Government on 23-12-1998. The salient features were that lease upto 20 hectares in river/*nallas* and upto two hectares in case of mid slope areas for setting up of stone crusher, lease upto two hectares for open sale in private land, lease upto five bighas for setting up of hollow block and screening plant with royalty rate of Rs. 5000 per bighas etc.

(iii) Mining Policy dated 28-2-2004: On directions from the Hon'ble High Court of Himachal Pradesh in CWP No. 188/01 titled as Jagjit Singh Dukhiya Vs State of Himachal Pradesh and others, "River/Stream Bed Mining Policy Guidelines for the State of Himachal Pradesh - 2004 were notified on 28-2-2004 and published in *Rajpatra* on 20-3-04. Its basic objectives are to ensure scientific and systematic mining, conservation of minerals, proper replenishment of minerals, protection of environment and ecology, protection of river banks, protection of public and private property, checking of illegal mining etc. The salient features of the policies are review of legislation; district level river/stream bed mining action plan/survey documents; extraction of minor minerals to be done in selected river/stream or river/stream sections; prohibition of specific river/stream or the river/stream sections for extraction of minor minerals; no river/stream bed mining shall be allowed within 75 metres from the periphery of soil conservation works, nursery plantation, check dams, 1/5th of its span or five metres from the bank whichever is higher, 200 metres upstream and downstream of Water Supply Scheme, 200 metres Up-stream and 200 to 500 metres Downstream of bridges, depending upon the site-specific conditions, or within the distance as recommended by the Sub-Divisional Committee, whichever is more, no mechanical mining *i.e.* through mechanical excavator etc. shall be allowed in river/stream beds, no boulder/cobbles/hand broken road ballast shall be allowed to be transported outside the State from river/stream beds, no digging of more than three feet shall be allowed in river/stream beds, preparation of Working-cum-Environment Plan has been made mandatory. This plan will give details of contour, reserves, method of mining steps to protect environment and above all the replenishment factor, short term permits in river/stream beds shall be issued only in exceptional cases, involvement of PRIs, Sub-Divisional Level Flying Squad under the Chairmanship of Sub Divisional Magistrate, District Level Committee under the Chairmanship of Deputy Commissioner and State Level Committee under the Chairmanship of Principal Secretary (Industries) to the Government of Himachal Pradesh.

(iv) Policy Guidelines for registration, location, installation and working of stone crushers in Himachal Pradesh (notified on 11/8/2004). On the directions from the Hon'ble High Court of Himachal Pradesh in CWP No. 228/02 titled as Sh. Desh Raj Vs State of Himachal Pradesh and others, the State Government has notified the Policy Guidelines for registration, location, installation and working of stone crushers in Himachal Pradesh. It defines procedures for registration and installation of stone crushers as per siting parameters as notified by the Department of Science and Technology on 29/4/03 and 10/9/04.

Forest Sector Policy, 2005: The Forest Sector Policy seeks to achieve Sustainable Forest Management in Himachal Pradesh, i.e., forests, watersheds, wildlife, biodiversity and habitats for the maintenance and rehabilitation of its environment and strive for enhanced livelihoods of the people of the State, especially women and other resource poor groups.

Within the framework of the National Forest Policy, 1988, the basic objectives of the Forest Sector Policy of Himachal Pradesh are: conserve and improve the status of natural resources in the State, especially forests, wildlife and biodiversity through effective

watershed management practices and strive towards an appropriate land use in the State, especially in the context of Sustainable Forest Management, focusing on other primary land use sectors, such as agriculture, horticulture, animal husbandry and those related to infrastructure development.

The Forest Sector Policy, 2005 has outlined following broad strategies:

- The Himachal Pradesh Forest Department (HPFD), in consultation with other stakeholders, will devise criteria and mechanisms to assess and categorise the State's forests into conservation, production, community and urban forests. Necessary modifications in the Working Plancodewillbemadetoaccordingly reorganise these forests in a time bound manner and make provisions for periodically reviewing such categories.
- The uniqueness of Himachal Pradesh as a Hill State and its unique physical and ecological status, especially those areas that are uncultivable, needs to be explained in reference to the National Forest Policy for justifying the extent of forest and tree cover and will be taken up with the Central Government.
- A coordinated and collaborative effort from all land using sectors will be made to achieve and enhance the target of 35.5 percent forest and tree cover through measures, such as reforestation and afforestation, agro forestry, farm forestry and utilising marginal and private lands for fodder development.

Section 6.12 of the said Policy describes 'industry, mining and hydel projects'. It mandates clearance from the Forest Department, concerned *Gram Sabha* and *Panchayats* at appropriate level for industries, especially having impact on the forest sector including mining and hydel projects in all cases involving forest and forest land. Further, the current Environment Impact Assessments and forest clearances for industry/mining/hydel projects do not take into account loss of forest use to village communities. The Central Government will be approached for necessary amendments in the guidelines under the FCA and the notifications under Environment Protection Act. The said Section set strategies for implementing policy directives. A resolution from the *Gram Sabha*, a 'No objection' from the Forest Department and advance payment for rehabilitation of the areas to be mined will be prerequisites for granting a mining lease. Necessary amendments in the *Panchayat* laws as well as Mining laws will be carried out in this regard. Environmental Cess will be levied on the Mining lessee by the concerned *Panchayat*. *Panchayat* laws needs to be amended in this regard. Systems for transparency and participatory monitoring by communities and/or other stakeholders of industries, especially those having impact on the forest sector including mining and hydel projects, will be introduced. The Central Government will be approached for necessary amendments in the guidelines under the FCA and the notifications under Environment Protection Act. Participatory mechanisms for planning, implementation and monitoring of Catchment Area Treatment Plans (CAT Plans) for hydel projects and mine management plans for Mining areas will be introduced. Special cost norms in the mountain context will be developed for rehabilitation of mined areas, dumping sites and other problem areas, such as land slide prone areas and cloud burst affected areas. The plans including the compensation packages will give due consideration to loss of forest use to village communities.

Section 6.10 of the said Policy describes 'Forest Based Industries'. It mandates that the Government will develop incentives to encourage wood based enterprises to procure raw materials from sources other than Government forests. The wood based industries in rural areas will be regulated through *Gram Sabhas*. Special attention will be given to value addition and diversification of wood and forest based products.

River/Stream Bed Mining Policy Guidelines for the State of H.P-2004 were

notified on 28-2-2004. No river/stream bed mining shall be allowed within 75 metres from the periphery of soil conservation works, nursery plantation, check dams, 1/5th of its span or five metres from the bank, whichever is higher, 200 metres Up-stream and Downstream of Water Supply Scheme, 200 metres upstream and 200 to 500 metres downstream of bridges depending upon the site-specific conditions or within the distance as recommended by the Sub-Divisional Committee, whichever is more.

The policy recommends watershed management through extensive soil conservation, catchment-area treatment (CAT), preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation, ecology, afforestation / biodiversity / tourism, agro-industries, hydro-power, non-agro-based industries, and navigation and other uses.

The Himachal Pradesh Minerals (Prevention of Illegal Mineral Transportation & Storage): It is meant for checking of illegal mining. Its rules are being framed. The salient features of the proposed Rules include compulsory registration of dealers to prevent illegal mining and storage of mineral; no transportation of mineral without transit pass; and penalty up to Rs. 25,000 (Rupees Twenty Five Thousand) for illegal transportation and storage of minerals.

State Water Policy: The policy mentions that, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use by incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin, so that the best possible combination of options can be selected and sustained."

The Himachal Pradesh Minor Minerals (Concession) Revised Rules, 1971: Section 15 of the National Environment Tribunal Act, 1995 empowers the State Governments to make rules in respect of minor minerals. The State of Himachal Pradesh has also enacted the Rules under this Section called, 'The Himachal Pradesh Minor Minerals (Concession) Revised Rules, 1971' in which the term minor mineral has been defined. The conditions of mining leases are provided under Rule 21. It is framed under Section-15 of Mines and Minerals (Development and Regulation), Act 1957 and is applicable to all minor minerals, i.e., building

materials, in the State of Himachal Pradesh. The said Rules define procedure for grant of Mining leases, Auction procedure and issuance of Short Term Permits, the area and period of lease, payment of royalties, deed rent etc.

The Himachal Pradesh Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2004 (Notified on 11-8-04): The Rules define procedures for transportation of minerals, storage of minerals, checking of illegal mining and its transportation and registration of dealers. Further mandatory rules and conditions for mining in hill slopes are:

- Mining Lease mandatory for running a stone crusher in order to ensure legal and regular supply of minor minerals. Every owner of stone crusher shall have a valid mining lease for this purpose. In respect of River/Stream Bed Mining leases over larger area of ten hectare or above shall be given priority for setting up of stone crushers.
- For Hill Slope mining, lease area shall depend upon the size of crusher, availability of mineral and annual requirement of mineral in relation to scientific mining. In any case, the area shall not be less than 15 *bighas*.
- If the area is less than 15 *bighas* and in no case less than five *bighas*, the period of lease shall be determined, based on reserves calculated and annual requirement as per the proposals given in the Working-cum-Environmental Management Plan, which every lease holder shall have to prepare.

Mining in Hill Slopes shall be subject to following general conditions

I. Environmental Considerations

i) No mining shall be allowed within 100 metres of thickly forested area.
ii) No mining shall be allowed in areas, which may cause aesthetic/visual degradation near any known tourist spot.
iii) No mining shall be allowed where it is likely to disrupt water regime, Irrigation & Public Health schemes, roads, bridges etc.
iv) No mining shall be allowed where danger to site of culture, religions, historical, archeological or scenic importance is likely.
v) No mining shall be allowed near habitation, where it is likely to cause noise and vibration problems, due to blasting or operation of machinery.
vi) No mining shall be allowed where proper disposal of mine waste cannot be arranged.
vii) Conditions shall be imposed that the lease holder will take adequate steps to control and check soil erosion, debris flow etc. by raising various engineering structure.

II. Geological and Geo-morphological Considerations

i) No mining shall be allowed where the slope angles are more than 45 degree from horizontal and in case of mid slope mining, the foot wall should be of hard strata.
ii) No mining lease shall be granted where the ore to overburden ratio is not economical, i.e., 1:0.2, that is, the waste generation should not be more than 20 percent.
iii) Proper appraisal of the deposit for its qualitative and quantitative assessment shall be made in the form of geological and topographical plans.

III. Technical Considerations

i) The area should not be highly jointed, fractured on consisting of weak planes.
ii) Relation of slope angle to angle of repose should be within mining parameters, where 6x6 metre benches, by keeping overall angle of repose as 45° can be made.
iii) No mining shall be allowed where subsidence of rocks is likely due to steep angle of slope.

iv) No overhangs shall be allowed to be formed during the course of mining.
v) The gradient of approach roads shall be gentle with hill-ward slope, side drains and parapet walls. Adequate number of waiting and crossing points shall be provided for safe plying of vehicles.
vi) No blasting shall be resorted to without taking proper licence under Explosive Act, 1884.

IV. General Conditions

i) Mining site shall only be handed over to the lease holder after it is duly demarcated by permanent boundary pillars and certified by concerned Mining Officer.
ii) Junction at take off point of approach road with main road shall be developed with proper width and geometrics required for safe movement of traffic by crusher owner at his own cost in consultation with Executive Engineer, Himachal Pradesh Public Works Department.
iii) No lease holder shall store/stack any material in the acquired width of Public Works Department road without the specific permission of the competent authority.
iv) In addition to above, the mining operation shall be subject to provisions of various Acts and Rules in force.
v) Dumping of waste shall be done in earmarked places as per the Working Plans.

Mineral Concession Rules, 1960: Application is required to be made on Form I (In triplicate) of Mineral Concession Rules, 1960. An affidavit showing particulars of the area mineral-wise in State, which the applicant or any person jointly with him - i) already holds under a mining lease; (ii) has already applied for but not granted; (iii) being applied for simultaneously, is needed. The applicant would show the area of mining lease required to be marked on the part of Topo-sheet No 53E/3 in the scale of 1:50000; mention special knowledge and experience in major cement plants in the country/abroad; the investment, which the applicant proposes to make in the field of mining and in the industry.

The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implementing the provisions of the Act, may (a) Issue guidelines for adoption of rain water harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural and urban areas; (d) undertake Information, Education and Communication activities including workshops, seminars, public discourses, debates, radio and television programmes to promote Rain Water Harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of Rain Water Harvesting for groundwater recharge in the notified areas, provided that in urban areas within the notified area no directions issued under these rules shall be applicable for construction of rain water harvesting structures: (a) in residential or commercial premises having plinth area of less than 100 square metres; or (b) in the sinking zones, where construction of rain water harvesting structures would be detrimental to the safety of the building structures in the area .

Himachal Pradesh Bricks (Control) Act, 1969 (Act No. 29 Of 1969): It's an Act to regulate the manufacture, storage, distribution, transport, acquisition and disposal of bricks in the State of Himachal Pradesh and for matters connected therewith. The Act defines 'Brick' as any piece of burnt clay fired in kiln and having a geometrical shape. The Act gives powers to control manufacture, storage, distribution etc. of bricks, if the Government is of opinion that

it is necessary or expedient to do so for maintaining or increasing the supply of bricks or for securing their equitable distribution and availability at fair prices, it may, by order notified in the Official Gazette, provide (a) for regulating by licenses, permits or otherwise the manufacture, storage, distribution, transport, acquisition or disposal of bricks; (b) for collecting any information or statistics with a view to regulating the aforesaid matters; (c) for the grant of issue of licenses, permits or other documents and the charging of fees therefore; (d) for controlling the prices at which bricks may be brought or sold; (e) for requiring dealer or kiln owners to maintain and produce for inspection such accounts and records regarding bricks and to furnish such information relating thereto, as may be specified in the order; (f) for any incidental and supplementary matters including entering and search of premises and vehicles and the seizure by a person authorised relating to make such search of the bricks in respect of which such person has reason to believe that contravention of any other regulations made under this Act has been, is being or is about to be committed.

The Himachal Pradesh Mineral Vesting of Rights Act, 1983: It's an Act to vest the mineral rights in the State Government and to provide for payment of amount to the owners of minerals and for other matters connected therewith. The Act defines 'minerals' as minerals and minor minerals as defined in clauses (a) and (e), respectively, of Section 3 of the Mines and Minerals (Regulation and Development) Act, 1957 (67 of 1957). The Act defines vesting of minerals in State Government as the State Government may, from time to time, by notification, acquire the right to any minerals in any land and the right to the minerals specified in the notification shall, from the date of its publication, vest in the State Government. The Act regulates the right to the minerals in the land, which includes the right of access to land for the purpose of prospecting and working mines and for the purposes subsidiary thereto, including the sinking of pits and shafts, erection of plants and machinery, construction of roads, stacking of minerals and deposit of refuse, quarrying and obtaining building and road materials, using water and taking timber and any other purpose, which the State Government may declare to be subsidiary to mining.

Himachal Pradesh Minerals (Vesting of Rights) Rules, 1989: The Rules define 'Minerals Bearing Land' as such land in respect of which right to any minerals therein contained is acquired under Section 3 of the Act.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act states framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism development scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the functions: (a) Mobilise voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) Identification of beneficiaries for the implementation of development schemes pertaining to the village; (c) Rendering assistance in the implementation of developmental schemes pertaining to the village.

- Approve plans, programmes and budget, prepared by the *Gram Panchayat*, for economic development and social justice.
- Authorise, after being satisfied, issuance of utilisation certificate of funds spent on the

implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for the maintenance and repair, such as (a) Deepen or otherwise improve water ways; (b) Notify the setting apart of any public water course for drinking or culinary purposes; and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat* at the village level; (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Chapter-XII of this Act describes the preparation of development plans and District Planning Committee. Preparation of development plans include: (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) Every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the *Zila Parishad, Panchayat Samitis, Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

The Himachal Pradesh Shops and Commercial Establishments Act, 1969 and Amended Act, 2004. (Act No-15 of 2004): The Act shall apply in the first instance to the limits of the Shimla Municipal Corporation and to the Municipal areas and cantonment limits; but the Government may, by notification in the Official Gazette, direct that it shall come into force in any other local area or shall apply to such establishments or of class of establishments in such other areas as may be specified in the notification. The Act defines 'commercial establishment' as any premises wherein any business, trade or profession is carried on for profit, and includes journalistic or printing establishments and premises in which business of banking, insurance, stocks and shares, brokerage or produce exchange is carried on or which is used as hotel, restaurant, boarding or eating house, theatre, cinema or other place of public entertainment or any other place, which the Government may declare, by notification, to be a commercial establishment for the purpose of this Act.

The Himachal Pradesh Factories (Control of Dismantling) Act, 1973 (Act No. 6 of 1974): It's an Act to control the dismantling of factories in Himachal Pradesh. The Act defines (a) 'to dismantle' a factory means to remove from its position, the machinery or part of the machinery of the factory, whereby such removal the factory is rendered, wholly or partly useless for its purposes; but does not include any temporary removal within the premises of the factory of the machinery or part of the machinery for purposes, such as adjustment, cleaning and repairs; (b) 'factory' means a factory as defined in clause (m) of Section 2 of the Factories Act, 1948, (63 of 1948), and includes a small scale industry unit with a capital investment of not more than

seven *lakhs* and fifty thousand rupees irrespective of the number of persons employed.

The Himachal Pradesh Essential Services (Maintenance) Act, 1973: It's an Act to make provisions for the maintenance of certain essential services. The Act defines 'Employment' as employment of any nature and whether paid or unpaid. This Act shall apply to (i) any employment or class of employment under the State Government, which the State Government may, by notification in the Official Gazette, specify; and (ii) any other employment or class of employment, which the State Government, being of opinion that such employment or class of employment is essential for securing the public safety, the maintenance of public order, health or sanitation, or for maintaining supplies or services necessary for the life of the community, may, by notification in the Official Gazette, declare to be an employment or class of employment to which this Act applies.

The Act Regulates Wages and Conditions of Service. The State Government may make rules regulating or empowering a specified authority to regulate wages or other conditions of service of persons or of any class of persons engaged in any employment declared under Section 3 to be an employment or class of employment to which this Act applies.

The Himachal Pradesh Fire Fighting Services Act, 1984 (Act No. 30 of 1984): It's an Act to provide for the maintenance of effective fire fighting services in the State of Himachal Pradesh.

Himachal Pradesh Infrastructure Development Act, 2001: The Act shall apply to such Infrastructure Projects as are implemented by a Government agency through Private Sector partnership under the provision of this Act and fall in the category of infrastructure projects specified in Schedule-I and such other infrastructure projects as are notified by the State Government, by notification, from time to time.

Himachal Pradesh Industrial Establishments (National and Festival Holidays and Casual and Sick Leave) Rules, 1969 Enacted on 1970-08-17): The Rules define four festival holidays required to be allowed under Section 3(1) (b)[Section 3(1) read with Section 15(2)(a)], shall be determined by the employer in consultation with the representatives of the workers before the 30th November each year for the ensuing calendar year. The holidays to be determined shall be notified to the workers before the 31st December each year, by exhibiting a copy of the same on the notice board kept at a conspicuous place where the majority of the workers enter the premises of the industrial establishment and also at the time keeper's office, if any; and a copy of the same shall be delivered to the Inspector of the area before the 31st December, each year. For exercising claim for half festival holiday as provided in proviso to Sub-section (1) of Section 3, a written application to this effect shall be received by the employer before the 31st October every year, which shall be signed by not less than 10 per cent workers of the industrial establishment on rolls on that day indicating the name of festivals on which they want to avail half holidays. If any difficulty in this behalf arises, that matter will be settled by the employer in consultation with the representatives of the workers.

Other Sub-Programmes /Strategies/Projects

Policy Guidelines for Control of Location, Installation or Working of Stone Crushers and their Registration: Taking into consideration the overriding principle of protection of ecology and environment to ensure that not a single stone crushing unit in the State causes any pollution of any type and is in consonance with the 'River/Stream Bed Mining Policy Guidelines for the State of Himachal Pradesh-2004', as notified on 28-2-2004, the State Government made Policy Guidelines for control of location, installation, working of stone crushers and registration

thereof. The Guidelines set mining lease mandatory for running a stone crusher, provisional registration of stone crusher, joint inspection of the areas applied for mining lease and for setting up of stone crusher, permanent registration, other conditions for running of stone crushers, conditions for mining leases including setting conditions for Mining in Hill slopes shall be subject to the following general conditions comprising environmental considerations, geological and geo-morphological considerations, technical considerations and general conditions.

Special Package of Incentives to Himachal Pradesh: In January 2003, the Government of India announced a special package of incentives to Himachal Pradesh. This includes 100 percent exemption from payment of Central Excise Duty for 10 years; 100 percent income tax exemption for five years and 25 percent and 30 percent exemption for the next block of five years (for Individuals and Companies); capital investment subsidy @ 15 percent of investment in Plant and Machinery subject to a ceiling of Rs. 30 *lakhs*. Apart from these, the Central Transport Subsidy is being provided to industrial units @ 75 percent of the cost of transportation of their finished goods and for transportation of their raw material from the location of their units anywhere in the State to the nearest, specified broad gauge rail head.

The Centre has also announced a special package of incentives for Himachal Pradesh and Uttaranchal, broadly along the lines of Jammu and Kashmir. It provides for concessions aimed at attracting new investments to these States. It will be a conscious policy of the Government to supplement this package with certain concessions and facilities from the State Government so as to ensure sustainable industrial development in the long run.

The State Government has set up a State Level Single Window Clearance and Monitoring Authority under the chairmanship of the Chief Minister to consider and give Government approvals in principle to medium and large scale projects in the State and to ensure optimum inter- departmental co-ordination. The State has also set up Single Window Agencies at major industrial towns, like Parwanoo, Baddi, Paonta Sahib, Goalthai and Sansarpur Terrace to facilitate speedy clearances and assist entrepreneurs in obtaining various clearances to set up their projects. The State Government, through these Single Window Agencies, will not only ensure initial approvals to set up the project, but also look into the requirements of obtaining further licenses necessary to commence production. It will also assist in obtaining all necessary State Government Departments related approvals from the concerned Departments. To facilitate clearances and monitoring of projects in the State and to make it transparent and user friendly, these agencies will be actively encouraged to use IT in their working and discharge of their functions. The services being offered by these agencies would be adequately highlighted through Industrial Associations and fora, like PHDCCI, FICCI, ASSOCHAM, CII etc. as channels for providing information to industry. The State Government would actively consider preparing and finalizing a separate framework for effective implementation of the Single Window System with a view to make Single Window Clearances a statutory requirement.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in infrastructure. It will be a plan scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria: (a)The project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector

company, the empowered committee may relax this eligibility criterion; (b) International Convention Centres and other tourism infrastructure projects; provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total viability gap funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total project cost. Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 *crores* (Rs. One Hundred *Crores*) for each project may be sanctioned by the Empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *crores* (Rs. Two Hundred *Crores*) may be sanctioned by the empowered committee, and amounts exceeding Rs. 200 *crores* may be sanctioned by the empowered committee with the approval of the Finance Minister.

Centrally Sponsored Schemes

Transport/Freight Subsidy: This is a 100 percent centrally sponsored scheme wherein the eligible industrial units are given subsidy @ 75 percent on the transportation costs paid on raw materials and finished goods from the location of the unit to the nearest railway heads and vice-versa. It is applicable to all eligible industrial units for a period of five years from the date of commencement of commercial production. Prior to 2004-05, this scheme was being implemented on the basis of 100 percent reimbursement from Government of India. This scheme was to continue up to 31.3.2007, but now this scheme has been extended further. Now for the scheme, Himachal Pradesh State Industrial Development Corporation (HPSIDC) has been declared as nodal agency for disbursement of claims on account of transport subsidy.

Central Capital Investment Subsidy: The Government of India has announced a Special Package of Incentives for Himachal Pradesh on 7.1.2003 wherein all the new industrial units in notified locations are eligible for capital investment subsidy @ 15 percent of their investment in plant and machinery, subject to a ceiling of Rs. 30.00 *lakhs*. The existing units are also entitled to this subsidy on their substantial expansion.

Office Memorandum No.1(10)/2001-NER Government of India, Ministry of Commerce and Industry (Department of Industrial Policy and Promotion), New Delhi, dated 7th January, 2003: The memorandum is concerned with the New Industrial Policy and other concessions for the States of Uttarakhand and Himachal Pradesh. It provides the following package of incentives for the States of Uttarakhand and Himachal Pradesh. The memorandum outlines fiscal incentives to new industrial units and to existing units on their substantial expansion, development of industrial infrastructure, other incentives including incentives, namely, *Deen Dayal Hathkargha Protsahan Yojna* and other incentives of the Ministry of Textiles. The funding pattern between Government of India and both the States would be changed from 50:50 to 90:10 under this Scheme. Ministry of Textiles would extend its package of incentives in Himachal Pradesh, which is included in the difficult area category, Ministry of Food Processing Industries, *Pradhan Mantri Rozgar Yojana (PMRY)*: Ministry of Agro and Rural Industries would provide for States of Himachal Pradesh and Uttaranchal relaxation under PMRY with respect to age (i.e. 18-40 years from 18-35 years) and Subsidy (@ 15 percent of the project cost subject to a ceiling of Rs.15,000/- per entrepreneur).

The memorandum gives locations identified under the new Industrial Policy for the States of Uttarakhand and Himachal Pradesh in Annexure 1. It gives existing identified

industrial locations where infrastructure has been developed through Government/ Government owned Corporations / Boards in Himachal Pradesh. These are Bilaspur Sadar, Hamirpur, Nadaun, Perri, Baldwara, Nahan, Dulehar, Kangra, Jawali, Nagrota Bagwan and Dehra. These are as per Enclosure 1 of the memorandum, which gives the names of the industrial area/estate district wise.
Commercial estates on private land/leased land throughout the State includes Indora, Gagal, Dharamshala, Gangath, Tapri in Kangra district; Tapri, Nichar in Kinnaur district; Bhunter, Ujhi, Kullu in Kullu district; Aut, Dehar, Bagshar in Mandi district; Darlaghat, Kasauli, Dharampur in Solan district; Paonta Sahib, Rajgarh in Sirmaur district; Gagret in Una district; Rawla Kwar, Sarahan, Sunni in Shimla district; Salooni in Chamba district.

New locations include Bahadurgarh, Ghumarwin, Kuthera, Balseena in Bilaspur district; Panjala, Banikhet, Chowari, Sihunta in Chamba district; Bijri, Nalti, Taal, Sujanpur-I, Bamson in Hamirpur district; Raja Ka Talab, Palampur in Kangra district; Moorang in Kinnaur district; Banjar, Sainj in Kullu district; Dhellu, Sundernagar, Chauntra, Gopalpur, Nachan, Tungal, Darang Sira in Mandi district; Theog, Jutogh, Rohru in Shimla district; Majra, Kamrao in Sirmaur district; Changar, Solan, Kandaghat, Arki, Patta in Solan district; Daulatpur, Ishpur, Una, Chururu in Una district.

Annexure – III of the memorandum categorises 20 activities in negative list for Himachal Pradesh. These activities are tobacco and tobacco products including cigarettes and pan masala; Thermal Power Plant (coal/oil based); Coal washeries/dry coal processing; Inorganic Chemicals excluding medicinal grade oxygen (2804.11), medicinal grade hydrogen peroxide (2847.11), compressed air (2851.30); Organic chemicals excluding Pro-vitamins/vitamins, Hormones (29.36), Glycosides (29.39), Sugars* (29.40) (Reproduction by synthesis not allowed as also downstream industries for sugar); Tanning and Dyeing Extracts; Tannins and their derivatives, dyes, colours, paints and varnishes; putty, fillers and other mastics; inks, Marble and mineral substances not classified elsewhere; Flour mills/rice mills; Foundries using coal, Minerals fuels, mineral oils and products of their distillation; Bituminous substances: mineral waxes, Synthetic rubber products, Cement clinkers and asbestos; raw materials including fibre; Explosive (including industrial explosives, detonators and fuses, fireworks, matches, propellant powders etc.); Mineral or chemical fertilisers, Insecticides, fungicides, herbicides and pesticides (basic manufacture and formulation); Fibre glass and articles thereof; Manufacture of pulp - wood pulp, mechanical or chemical (including dissolving pulp); Branded aerated water/soft drinks (non-fruit based); Paper (Writing or printing paper etc., paper or paperboard etc., Maplitho paper etc., newsprint, in rolls or sheets, Craft paper etc., sanitary towels etc. cigarette paper, grease-proof paper.

Land Bank: The Department of Industries has identified land in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts of the State and has constituted a Land Bank comprising private land totaling **5089-09 *bighas*** and Government land totaling **1771-17 *bighas*,** which are available for setting up of Industries. The private land comprises of such lands, whose owners have consented to sell their land to private entrepreneurs through mutual negotiation. The Department of Industries, Government of Himachal Pradesh, will provide escort and facilitation service in case the entrepreneurs are willing to purchase such private land.

In January 2010, Central Pollution Control Board (CPCB), in association with Indian Institute of Technology (IIT), New Delhi, have carried out an environmental assessment of industrial clusters across the country based on Comprehensive Environmental Pollution Index (CEPI) with the aim of identifying polluted industrial clusters and prioritising planning needs for intervention to improve the quality of environment in these industrial

clusters and the nation as a whole. The assessment so carried out has been documented in the form of a report entitled, 'Comprehensive Environmental Assessment of Industrial Clusters'. In all, 99 industrial clusters have been assessed. The report has concluded that the industrial clusters/areas having aggregated CEPI scores of 70 and above should be considered as critically polluted; the clusters/areas having CEPI scores between 60-70 should be considered as severely polluted areas (in Himachal Pradesh, Baddi, Kala Amb and Parwanoo fall under this category) and shall be kept under surveillance and pollution control measures should be efficiently implemented; and the critically polluted industrial clusters/areas need further detailed investigations in terms of the extent of damage and formulation of appropriate remedial action plan. The developmental projects from industrial clusters with CEPI score between 60-70 (as listed at serial no. 44 to 75 of the Annexure), which are in the pipeline or have been received for grant of environmental clearance in terms of the provisions of EIA Notification, 2006 [including projects for stage-I clearance, i.e., scoping (TORs)], will be considered following the procedure outlined in MoEF's earlier circular no.]-11013/18/2009-IA.II (I) dated 25th August, 2009 relating to 'proposals for environment clearance for the projects located in the critically polluted areas as identified by the Central Pollution Control Board'.

Zoning Atlas and Associated Activities: Apart from its regulatory role, the State Pollution Control Board is undertaking a pro-active visionary approach by making use of scientific tools such as Geographical Information System (GIS) application for environment management etc. To undertake the Spatial Environmental Planning Programme, the State Board has a state of art facility in terms of infrastructure and technical manpower. It has so far covered all the districts under Zoning Atlas for siting of industries. In addition, the State Board has also taken lead towards revising all these Zoning Atlas as per the modified criteria devised by the Central Pollution Control Board and the Ministry of Environment and Forests, Government of India and, consequently, more sites are available now for sustainable industrialisation. The summary of the activities undertaken/being undertaken by the State Board in order to achieve the objectives of sustainable industrialisation are as follows:

1. Zoning Atlas for siting of industries for all districts of the State.
2. Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur.
3. State Environmental Atlas of Himachal Pradesh.
4. District-wise Environmental Atlases for Solan, Sirmaur, Kangra, Mandi and Hamirpur and remaining districts are also being covered.

The Central Pollution Control Board, in consultation with State Pollution Control Boards, has identified 24 areas in the country as critically polluted areas. In Himachal Pradesh, Kala-Amb and Parwanoo are identified as critically polluted areas.

Health Vision 2008: The Health Vision 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for attainment of targets. The primary goal of vision 2008 is to achieve the status –Health for All.
Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen existing system to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.

Ongoing initiatives of NAPCC

- **Power Generation:** The Government is mandating the retirement of inefficient coal-fired power plants and supporting the research and development of Integrated Gasification Combined Cycle (IGCC) and supercritical technologies.

- **Renewable Energy:** Under the Electricity Act 2003 and the National Tariff Policy 2006, the Central and the State electricity regulatory commissions must purchase a certain percentage of grid-based power from renewable sources.

- **Energy Efficiency:** Under the Energy Conservation Act 2001, large energy consuming industries are required to undertake energy audits and an energy labeling programme for appliances has been introduced.

2.6 Industry

The policies and laws applicable and/or related to Industries sector of the State along with a brief description of their relevance are listed below. Detailed explanations can be acquired from the websites of relevant Departments and line Ministries, like Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Commerce and Industries (http:// commerce. nic.in/), and Ministry of Mines (http://mines.nic.in), Government of India and Department of Industries, Government of Himachal Pradesh (http:// himachal. gov.in /I ndustry / welcomelat. htm).

National Level Policies / Regulations

Constitution of India, Mineral Regulation: Ownership of the minerals rests with the State and the Central Government is required to regulate the mines and minerals development to the extent declared in accordance with Entry 54 Union List of the Seventh Schedule of the Constitution. The power of the States to regulate mines or minerals development is subject to Entry 23, List II, State List in the Seventh Schedule.

The Foreign Trade Policy 2009-2014 (FTP): In exercise of powers conferred by Section 5 of the Foreign Trade (Development and Regulation) Act, 1992 (No. 22 of 1992) read with paragraph 1.2 of the Foreign Trade Policy, 2009-2014, the Central Government hereby notifies the Foreign Trade Policy, 2009-2014 as contained in Annexure to this notification. The Policy shall come into force w.e.f. 27 th August, 2009. The FTP incorporates provisions relating to export and import of goods and services, shall come into force with effect from 27th August, 2009 and shall remain in force upto 31st March, 2014 unless otherwise specified. All exports and imports upto 26th August 2009 shall be accordingly governed by the FTP 2004-2009.

The special focus of FTP on Agriculture and Village Industry is on (a) *Vishesh Krishi and Gram Udyog Yojana* (VKGUY) (b) Capital goods imported under EPCG will be permitted to be installed anywhere in AEZ. (c) Import of restricted items, such as panels, are allowed under various export promotion schemes. (d) Import of inputs, such as pesticides are permitted under Advance Authorisation for agro exports. (e) New towns of export excellence with a threshold limit of Rs 150 *crores* shall be notified and (f) Certain specified flowers, fruits and vegetables are entitled to a special duty credit scrip, in addition to the normal benefit under VKGUY.

Green Products and Technologies: India aims to become a hub for production and export of green products and technologies. To achieve this objective, special initiative will be taken to promote development and manufacture of such products and technologies for exports. To begin with, focus would be on items relating to transportation, solar and wind power generation and other products as may be notified, which will be incentivised under Reward Schemes

Industrial Policy: Objectives of the Industrial Policy of the Government of India are to: maintain a sustained growth in productivity; enhance gainful employment; achieve optimal utilisation of human resources to attain international competitiveness and transform India into a major partner and player in the global arena.

The Industrial Policy focuses on deregulating Indian industry; allowing the industry freedom and flexibility in responding to market forces; and providing a policy regime that facilitates and fosters growth of Indian industry.

Some of the important policy measures announced and procedural simplifications undertaken to pursue the policy objectives are: liberalisation of Industrial Licensing Policy Introduction of Industrial Entrepreneurs' Memorandum (EM); liberalisation of the Locational Policy; Policy for Small Scale Industries; Non-Resident Indians Scheme; Electronic Hardware Technology Park (EHTP)/Software Technology Park (STP) Scheme; and Policy for Foreign Direct Investment (FDI)

The National Water Policy, 2002: In the planning and operation of systems, water allocation priorities should be broadly drinking water, irrigation, hydro-power, ecology, agro-industries and non-agricultural industries, navigation and other uses. However, the priorities could be modified or added if warranted by the area/region specific considerations.

National Policy on Resettlement and Rehabilitation, 2007: It is applicable when more than a defined number of families are displaced for a project. The threshold is 400 or more displaced families (DF) *en masse* in plains and 200 DF or more in tribal or hilly areas, Desert Development Programme (DDP) blocks or areas under Schedule V and VI of the Constitution of India.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

National Solar Mission under the NAPCC aims to promote the development and use of solar energy for power generation and other uses with the ultimate objective of making solar energy competitive with fossil-based energy options. The plan includes specific goals for increasing use of solar thermal technologies in urban areas, industry, and commercial establishments; a goal of increasing the production of photovoltics to 1000 MW/year; and a goal of deploying at least 1000 MW of solar thermal power generation. Other objectives include the establishment of a Solar Energy Research Centre; increased international collaboration on technology development; strengthening of domestic manufacturing capacity; and increased Government funding and international support.

National Mission for Enhanced Energy Efficiency: Current initiatives are expected to yield savings of 10,000 MW by 2012. Building on the Energy Conservation Act, 2001, the plan recommends mandating specific energy consumption decreases in large energy-consuming industries, with a system for companies to trade energy-saving certificates; energy incentives, including reduced taxes on energy-efficient appliances; and financing for Public-Private Partnerships to reduce energy consumption through demand-side management programmes in the Municipal buildings and agricultural sectors.

National Mission for Sustaining the Himalayan Ecosystem: The plan aims to conserve biodiversity, forest cover and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming.

National Mission for a 'Green India': Goals include the afforestation of six million hectares of degraded forest lands and expanding forest cover from 23 percent to 33 percent of India's territory.

National Mission on Strategic Knowledge for Climate Change: To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund, improved climate modelling and increased international collaboration. It also encourages Private Sector initiatives to develop adaptation and mitigation technologies through venture capital funds.

The National Environment Policy (NEP), 2006: Section 5.1.3 Substantive Reforms of NEP states that Environmental Impact Assessment (EIA) will continue to be the principal methodology for appraising and reviewing new projects. The assessment processes are under major revision in line with the Govindarajan Committee recommendations. Under the new arrangements, there would be significant devolution of powers to the State/UT levels. However, such devolution, to be effective, needs to be accompanied by adequate development of human and institutional capacities. Further, in order to make the clearance processes more effective, the following actions will be taken: Point (d) of Section 5.1.3 states, "Encourage clustering of industries and other development activities to facilitate setting up of environmental management infrastructure, as well as monitoring and enforcing environmental compliance. Emphasise post project monitoring and implementation of environmental management plans through participatory processes, involving adequately empowered relevant levels of Government, industry and the potentially impacted community." Further, point (g) seeks to ensure provision for environmental restoration after decommissioning of industries, in particular, mine closure in all approvals of mining plans and institutionalise a system of post-monitoring of such projects.

Section 5.2.10 of NEP on Climate Change point G states, "Encourage Indian Industry to participate in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects including in the financial sector."

Section 5.3.1 on Environmental Standards states, "Encourage Indian Industry to participate in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects, including in the financial sector." It suggests following specific actions: a) Set up a permanent machinery comprising experts in all relevant disciplines to review notified ambient and emission standards in the light of new scientific and technological information, as they become available, and changing national circumstances, ensuring adequate participation by potentially impacted communities, and industry associations. b) Strengthen the testing infrastructure and network for monitoring ambient environmental quality, including through participation by local communities, and Public-Private Partnerships. Progressively ensure real time, and on-line availability of the monitoring data.

Section 5.4 on Clean Technologies and Innovation suggests actions, like a) encourage capacity building in the financial sector for appraising clean technology switchover project proposals. b) Set up a mechanism to network technology research institutions in the country, public and private, for cooperation in technology research and development and adaptation, information, and evaluation of clean technologies. Create a database of such technologies, and promote dissemination of new technologies developed both in India and abroad. c) Consider use of revenue enhancing fiscal instruments to promote shifts to clean technologies in both existing and new units. d) promote adoption of clean technologies by industry, in particular in the small and medium sector, through regulatory and fiscal measures, and standards setting.

Section 5.6 on Partnerships and Stakeholder Involvement states that conservation of the environment requires the participation of multiple stakeholders, who may bring to bear their respective resources, competencies, and perspectives, so that the outcomes of partnerships are superior to those of each acting alone. Implementing and policy making agencies of the Government, at Central, State, Municipal, and *Panchayat* levels; the legislatures and judiciary; the public and private corporate sectors; financial institutions; industry associations; academic and research institutions; independent professionals and experts; the media; youth clubs; community based organisations; voluntary organisations; and multilateral and bilateral development partners, may each play important roles in partnerships for the formulation, implementation, and promotion of measures for environmental conservation.

The following provisions are, accordingly, made for review, updating and renewal of the National Environment Policy by undertaking consultations every three years with groups of diverse stakeholders, i.e., researchers and experts, community based organisations, industry associations, and voluntary organisations and update the National Environment Policy.

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralised public health system by establishing new infrastructure in deficient areas and by upgrading the infrastructure in the existing institutions.

The policy hoped that the independently stated policies and programmes of the environment related sectors be smoothly interfaced with the policies and the programmes of the health sector, in order to reduce the health risks to the citizens and the consequential disease burden.

This policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognises the significant contribution made by NGOs and other institutions of the civil society in making available health services to the community. It also emphasises the need to simplify procedures for Government – civil society interface in order to enhance the involvement of civil society in public health programmes.

The Environment (Protection) Act, 1986: It is a comprehensive legislation on environment that empowers the Central Government to take appropriate measures for the purpose of protecting and improving the environment. It provides for laying down standards for controlling emissions and effluent discharges of environmental pollutants; to regulate industrial locations; to prescribe procedures for managing hazardous substances; to establish safeguards for preventing accidents; and to collect and disseminate information regarding environmental pollution. In accordance with this Act, the Central Government has issued a number of regulations affecting sectors, such as hazardous and chemical wastes, genetically engineered micro-organisms and industrial development of coastal zones.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment Protection Act are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Environment (Siting for Industrial Projects) Rules, 1999, Environment (Protection) Act, 1986: Under clause (v) of Sub-section (2) of Section 3, Sub-section (1) of Section 6 and Section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with

rule 5 of the Environment (Protection) Rules, 1986, the Central Government made rules for Siting Industrial Projects, namely Environment (Siting for Industrial Projects) Rules, 1999. The said rules prohibit setting up of certain industries. It specifies four conditions, namely, (a) No new unit of the industries listed in Annexure-I shall be allowed to be set up in the entire area within the Municipal limits of all Municipal Corporations, Municipal Councils and *Nagar Panchayats* (by whatever name these are known in each State) and a 25 kms belt around the cities having population of more than one million. (b) Seven kms belt around the periphery of the wetlands listed in Annexure-II. It is to be noted that no wetlands in Himachal Pradesh is listed in Annexure II. (c) 25 kms belt around the periphery of National Parks, Sanctuaries and core zones of Biosphere Reserves and (d) 0.5 km wide strip on either side of National Highways and rail lines.

The Rules provides for establishment of New Units with certain conditions: Establishment of new units of the industries listed in Annexure-I shall be allowed in seven to 25 kms belt around the periphery of the wetlands listed in Annexure-II only after careful assessment of their adverse ecological and environmental impacts. Further, Rules provide for the establishment of New Units around Archaeological Monuments. It stipulates that new units of industries listed in Annexure-III shall not be allowed to be set up within seven kms periphery of important archaeological monuments listed in Annexure-IV. No monument from Himachal Pradesh is listed in Annexure IV.

The Forest (Conservation) Act, 1980: The Forest (Conservation) Act, 1980 as amended in 1988, checks the indiscriminate diversion of forest land for non-forest purposes. It primarily deals with discouraging the diversion of forestlands for non-forestry purpose, mainly industry and mining. It requires State Governments to acquire the approval of the Central Government before it denotifies any forest, leases forest land to a private person or corporation, or clears it, even for the purpose of reforestation.

Prior clearance of projects requiring diversion of forests for non-forest purpose is needed under the Forest (Conservation) Act, 1980. The State Government/Union Territories are required to submit formal proposals to the Central Government (Ministry of Environment and Forests) for diversion of forest land for non-forest purposes in the prescribed proforma along with details, such as flora, fauna, map of the area, compensatory afforestation proposed etc. Therefore, as far as possible, non-forest land should be selected for projects.

As per the amended Forest (Conservation) Rules in force now, the Regional Chief Conservator of Forests has the powers to decide proposals involving forest land upto five hectares. Proposals involving forest land between 5 - 20 hectares shall be processed by the Regional Chief Conservator in consultation with a State advisory group consisting of representatives of the concerned State Government. Proposals involving more than 20 hectares of forest land are required to be placed before the Advisory Committee constituted by the MoEF, Government of India.
Some important guidelines laid down in Forest (Conservation) Act, 1980 and Rules, 1981 for diversion of forest land for non-forest purposes, which may be relevant for Himachal Pradesh, are given below.

- These guidelines ensure that ecological considerations are in no way undermined while examining investment proposals. The State Government or the Union Territory administration concerned is required to envisage, at the initial stage itself, the different likely impacts of the proposed project, starting with the proposed site. The guidelines specify certain criteria for the siting of an industry. It states that no project should be in the vicinity of National Parks, Wildlife Sanctuaries and Core areas of the Biosphere Reserves. Further, the

project needs to consider scenic landscapes, areas of geo-morphological significance, unique and representative biomes and eco-systems, heritage sites/structures and areas of cultural heritage and importance. It also includes fragile eco-systems, such as mountains, areas rich in coral formations as well as desert, wetland, and riverine eco-systems; areas rich in biological diversity, gene pool and other natural resources.

- Investors in industrial projects involving forest land are required to undertake detailed Environmental Impact Assessment Studies of their projects with respect to physical resources, hydrology and water quality, socio-economic aspects, human use values etc.
- Besides forest lands, diversion of prime agricultural lands for non-forest purposes are also restricted.
- Investigations and surveys carried out in connection with hydro-electric projects, transmission lines, seismic surveys, exploration for oil drilling or mining will not attract the provisions of the Forest Act, provided these surveys are restricted to only clearing of bushes and lopping of tree branches and do not involve clearing of forests or cutting of trees.
- Such surveys, investigations and explorations are prohibited in Sanctuaries, National Parks, Biosphere Reserves and in the preservation and sample plots under the Wildlife (Protection) Act, 1972.
- The permission to survey, explore or prospect does not imply any commitment on the part of the Central Government for any subsequent use of the forest land.

The Environment (Protection) Fifth Amendment Rules, 2008: The Rules defined parameters for emissions from Common Hazardous Waste Incinerator, namely, Particulate matter, HCl, SO_2, CO, Total Organic Carbon, HF, NOx (NO and NO_2 expressed as NO_2), Total dioxins and furans, Cd + Th + their compounds, Hg and its compounds, Sb + As + Pb + Co + Cr + Cu + Mn + NI + V + their compounds.

Environment (Protection) Seventh Amendment Rules, 2008: The Amendment sets emission standards for Incinerator for Pesticide Industry, namely, Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans (Existing Incinerator and New Incinerator), Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + their compounds.

The amendment sets standards for Wastewater as following: (i) Wastewater (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollution (Part A: Effluents) notified under the Environment (Protection) Rules, 1986. (ii) The built up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/I over and above the Total Dissolved Solids of raw water used.

Environment (Protection) Eighth Amendment Rules, 2008: The Amendment is made in the Environment (Protection) Rules, 1986, in Schedule I (a) In serial number 94 relating to 'Noise Limit for Generator Sets Run with Diesel', in paragraph 3.2. (i) for the words every 'manufacturer' or 'importer' (hereinafter referred to as 'supplier'); every 'manufacturer' or 'assembler' or 'importer' (hereinafter referred to as the 'manufacturer') shall be substituted; (ii) for the words 'manufactured or imported', the words 'manufactured or assembled or imported' shall be substituted.

Transportation of Diesel Generator Sets (above 250 KVA)

a. Diesel Generator set shall be transported after fulfilling the requirement of certification specified in paragraph 3.2 as a complete unit with acoustic enclosure, or dismantled, with relevant genset number specified on acoustic enclosure and silencer for reassembling at the site of its operation.
b. Compliance with the noise norms shall be monitored after reassembling the D.G. set at the location of the installation by the concerned State Pollution Control Board

or, as the case may be, by the Union Territory Pollution Control Committee.

Environment (Protection) Second Amendment Rules, 2009: The Amendment is made in the Environment (Protection) Rules, 1986, in Schedule I, in serial number 73 relating to Pharmaceuticals Industry (Bulk Drugs). The Rules define:

Parameters for emission from Incinerator, namely, Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans, Existing Incinerator, New Incinerator Sb + As + Cr + Cp + Ci + Mo + V + Cd + Th + Hg and their compounds.

Parameters for effluent from Incinerator (i) Effluent from scrubber(s) and floor washing shall flow through closed conduit/pipe network. (ii) Storm water shall not be allowed to mix with scrubber water and or floor washings. (iii) Storm water shall be channelized through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall. (iv) The build up in Total Dissolved Solids (TDS) in Wastewater of floor washings shall not exceed 1000 mg/l over and above the TDS of raw water used. (v) Effluent shall not be stored in holding tank(s) in such manner, which may cause pollution to groundwater. (vi) Effluent (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollutions (Part A: Effluents) notified under the Environment (Protection) Rules, 1986.

Environment (Protection) Amendment Rules, 2009: In the Environment (Protection) Rules, 1986, amendment is made in Schedule I, for Refractory Industry. The Rules define: A. Emission Standards for (i) Down Draft Kiln Category, namely, Particulate matter and Stack height (ii) Other than (Fuel: Coal) Particulate matter, Stack height, (iii) Box, Tunnel, Down Draft Kiln etc. (Fuel: Natural Gas/Producer Gas/LPG or a combination of Fuels/Furnace Oil as Secondary Fuel), Particulate matter, Stack height, (iv) Rotary Kiln Category, Particulate matter, Stack height, Small medium large category, i.e., Small rotary kiln, medium kiln and large rotary kiln.

Effluent Standards for pH, Oil and grease, Biochemical Oxygen Demand (3 days, 27 degrees), Chemical Oxygen Demand, Suspended Solids, phenols, Cyanide as CN, Cr (hexavalent) and Cr (total) for Inland surface water, public sewer and land for Irrigation.

Environment (Protection) (Sixth Amendment) Rules, 2010: The Rules regulate (a) Iron Ore Mining and Ore Processing and set emission Standards for Stack for De-dusting Unit, Particulate matter, Stack height; (b) Fugitive Emission Standards for Particulate matter. Fugitive emission shall be monitored in the predominant downwind direction at a distance of 25.0 + 2.0 metres from the source of fugitive emission as per following:

Area: Mine face/benches and monitoring location, namely, drilling, excavation and loading applicable for operating benches above water table.
Area: Haul roads/service roads and monitoring location, namely, haul roads to ore processing plant, waste dumps and loading areas and service road.
Area: Crushing plant and monitoring location, namely, run-off mine unloading at hopper, crushing areas, screens and transfer points.
Area: Screening plant and monitoring location, namely, screens, conveying and transportation of ore discharge points.
Area: Ore storage and loading and monitoring location, namely, intermediate stock bin/pile areas, ore stock bin/pile areas, wagon/truck loading areas.
Area: Waste dump and monitoring location, namely, active waste/reject dumps
C. Effluent standards defined for pH, suspended solids (non-rainy day), suspended solids (rainy day), and oil and grease.

Environment (Protection) Second Amendment Rules, 2010: The Amendment in the Rules regulate Plaster of Paris Industry. A

Production Capacity upto 30 tonnes per day (tpd), Stack Emission Standards defined for particulate matter from Crusher, Calciner, Furnace and Grinder. Production Capacity above 30 tonnes per day (tpd), Stack Emission Standards defined for Particulate matter from Crusher, Calciner, Furnace and Grinder,

Environment (Protection) Third Amendment Rules, 2010: The Amendment is made for serial number 8 and the entries relating thereto. The following serial number and entries shall be substituted, namely, the Dye and Dye Intermediate Industry:

A. Effluent Standard Parameters
pH, Suspended Solids, Biochemical Oxygen Demand 3 days (27ºC Temperature), Colour, Mercury (as Hg), Chromium (as Cr_6), Chromium (Total Chromium as Cr), Copper (as Cu), Zinc (as Zn), Nickel (as Ni), Lead (as Pb), Manganese (as Mn), Cadmium (as Cd), Chloride (as Cl), Sulphate (as SO_4), Phenolic Compounds (as C_6H_5OH), Oil and Grease and Bioassay Test

B. Emission Standards for Incinerator, namely, Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans

Existing Incinerator/ New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds

C. Effluent Standards for Incinerator

1. Effluent from scrubber(s) and floor washing shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mention at 'A' above.
2. The built up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/l over and above the Total Dissolved Solid of raw water used.

D. Storm water

(i) Storm water shall not be allowed to mix with scrubber water and/or floor washings.
(ii) Storm water shall be channelized through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

Environment (Protection) Fourth Amendment Rules, 2009: In the Environment (Protection) Rules, 1986, in ScheduleI,forserialnumber74relatingto 'Emission Standards for Brick Kilns' and entries relating thereto, the following serial number and entries shall be substituted, namely- Brick Kilns' emission standard for i) Bulls, Trench Kiln (BTK) for Particular matter, Stack height, (ii) Down Draft Kiln (DDK), Particular matter and Stack height, (iii) Vertical Shaft Kiln (VSK) Particular matter and Stack height.

Environment (Protection) Fourth Amendment Rules, 2010: In the Environment (Protection) Rules, 1986, in Schedule-I, in serial number 68 and the entries relating thereto, the following serial number and entries shall be substituted for Organic Chemicals Manufacturing Industry Effluent Standards.

A. Effluent standard Parameters: pH, Biochemical Oxygen Demand (3 days 27ºC), Oil & Grease, Bioassay test + Nitrate (as N), Arsenic (as As), Chromium (Hexavalent), Chromium, Lead (as Pb), Cyanide (as CN), Zinc (as Zn), Mercury (as Hg), Copper (as Cu), Nickel (as Ni), Phenolics (as C_6H_5OH) and Sulphide.

B. Emission Standard Parameters for Incinerator: Limiting concentration in mg/Nm^3, unless otherwise stated, Particulate Matter, HCl, SO_2, CO, Total Organic carbon, Total Dioxins Existing, and Furans, Incinerator and New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds.

C. Effluent Standards for Incinerator: (i) Effluent from scrubber(s) and floor washing

shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mentioned at 'A' above, (ii) the built up in Total Dissolved Solids (TDS) in waste water of floor washings shall not exceed 1000 mg/I over and above the Total Dissolved Solids of raw water used.

D. Storm water (i) Storm water shall be allowed to mix with scrubber water and/or floor washings. (ii) Storm water shall be channellised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

Environment (Protection) Fifth Amendment Rules, 2010: The Amendment in the Environment (Protection) Rules,, 1986, is made in Schedule I, at serial number 55 relating to Common Effluent Treatment Plants: B. Treated Effluent Quality of Common Effluent Treatment Plant, at parameter relating to 'Oil and Grease' (Concentration in mg/l) for disposal into Marine Coastal areas, for the figure '20', the figure '10' shall be substituted. Further, the Amendment is made in Schedule VI relating to General Standards for Discharge of Environmental Pollutants, Part A: Effluents, at serial number 7, at parameter relating to 'Oil and Grease' (mg/I max.), in column number 3(d), for the figure '20', the figure '10' shall be substituted.

Energy Conservation Act, 2001: According to this Act, usage of energy should be kept at minimum both at the point of generation as well as on the point of application. These include short term as well as long term measures. The short term measures include: energy conservation; energy audit of Government buildings; and capacity building amongst departments to take up energy efficiency programmes. The long term measures include: industry specific task forces; notifying more industries as designated consumers; conduct of energy audit amongst notified designated consumers; recording and publication of best practices (sector wise); development of energy consumption norms; and monitoring of compliance with mandated provision by designated consumers.

Wildlife (Protection) Act, 1972: The Government of India enacted the Wild Life (Protection) Act, 1972 with the objective of effectively protecting the wildlife and to control poaching, smuggling and illegal trade in wildlife and its derivatives. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent. The Ministry of Environment and Forests has proposed further amendments in the law by introducing more rigid measures to strengthen the Act. The objective is to provide protection to the listed endangered flora and fauna and ecologically important protected areas.

The Public Liability Insurance Act, 1991: After the Bhopal Gas Leak Tragedy, Parliament enacted the Act called, 'The Public Liability Insurance Act, 1991'. Section 2 defines 'accident' to mean an accident involving a fortuitous, or sudden or unintended occurrence while handling any hazardous substance, resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property, but does not include an accident by reason only of war or radio-activity. The Act provides for the owner to take out insurance policies, the procedure for making application for relief and the award of relief. Section 13 empowers the Central Government or any person authorised by that Government on this behalf, when it has reason to believe that any owner has been handling any hazardous substance in contravention of any of the provisions of the Act, that Government or, as the case may be, that person may make an application to a court, not inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of first class for restraining such owner from such handling. The other provisions of the Act are regarding penalties, offences by Companies, offences by the Act in 1992, which, inter alias, provides for

establishment of Environmental Relief Fund. Section 7-A provides that the Central Government may, by notification, establish a fund to be known as the Environmental Relief Fund.

National Environment Tribunal Act, 1995: The Act to provide for liability for damages arising out of any accident occurring while handling hazardous substance and for the establishment of a National Environment Tribunal for effective and expeditious disposal of cases arising from such accident, with a view to giving relief and compensation for damages to persons, property and the environment and for matters connected with or incidental thereto. The term 'accident' has been defined to mean accident involving a fortuitous or sudden or unintended occurrence while handling any hazardous substance, resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property or environment, but does not include an accident by reason only of war or radio-activity.

A newly added Section 17-A, to the said Central Act provides that the Central Government, with a view to conserving any mineral and after consultation with the State Government, may reserve any area not already held under any prospecting license or mining lease and, where it proposes to do so, it shall, by notification in the Official Gazette, specify the boundaries of such area and the mineral or minerals in respect of which such area will be reserved.

The Central Government enacted the Mineral Conservation and Development Rules, 1888 under Section 18 of the Mines and Minerals (Regulation and Development) Act, 1957. Rule 4 provides that every holder of prospecting license shall submit to the Controller General and provides that every holder of prospecting license shall submit to the Controller General and the Regional Controller, or the authorised officer within a period of 60 days from the date of execution of the prospecting license, a scheme of prospecting, indicating the manner in which he proposes to carry out the prospecting operations in the area covered by the license. Rule 9 requires submission of mining plan and the mining operation is to be carried out in accordance with this plan.

Chapter-V of the Rules deals with environment, providing for taking all possible precautions for the protection of environment and control of pollution while conducting prospecting and control of pollution while conducting prospecting, mining, beneficiation or metallurgical operations in the area. The Rules also provide for removal and utilisation of top soil; storage of overburden, waste, rock etc.; reclamation and rehabilitation of lands; taking precautions against air pollution; taking precautions with regard to discharge of toxic liquid; taking precaution against noise; and restoration of flora.

The Parliament has also enacted the Mines Act, 1952 and Mines Rules have also been framed called the Mines Rules, 1955. The aforesaid Act and Rules along with the Metalliferous Mines Regulations, 1961 enacted under Section 57 of the Mines Act provide for scientific mining.

National Environmental Appellate Authority Act, 1997: National Environmental Appellate Authority Act, 1997 provides appellate forum for cases relating to site restrictions, developmental schemes and projects so as to balance development and environment.

Factories Act, 1948: The Act defines 'factory' as any premises including the precincts thereof - (i) whereon ten or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on; or (ii) whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of

1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines 'hazardous process' as any process or activity in relation to an industry specified to the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would - (i) cause material impairment to the health of the persons engaged in or connected therewith, or result in the pollution of the general environment, whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines 'Manufacturing Process' as any process for - (i) making, altering, repairing, ornamenting, finishing, packing, oiling, washing, cleaning, breaking up, demolishing, or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal, or (ii) pumping oil, water, sewage or any other substance; or (iii) generating, transforming or transmitting power; or (iv) composing types for printing, printing by letter press, lithography, photogravure or other similar process or book binding; (v) constructing, reconstructing, repairing, refitting, finishing or breaking up ships or vessels; (vi) preserving or storing any article in cold storage.

It defines 'Worker' as a person employed, directly or by or through any agency (including a contractor) with or without the knowledge of the principal employer, whether for remuneration or not, in any manufacturing process, or in cleaning any part of the machinery or premises used for a manufacturing process, or in any other kind of work incidental to, or connected with, the manufacturing process, or the subject of the manufacturing process, but does not include any member of the armed forces of the union.

Land Acquisition Act, 1894: Land requirements for mining activities and all their associated facilities can be significant. Land acquisition is being done under the Land Acquisition Act 1894, amended in 1984. Historically, land for large mines has been acquired by the State. The Land Acquisition Act, 1894 is currently being modified to link it with the Resettlement and Rehabilitation (R&R) policy. The draft version of the Act seeks to make resettlement and rehabilitation enforceable, includes livelihoods, habitats, cultural and natural resources as critical areas of impact to be compensated and addressed, and, modification of the clause of 'public purpose' for acquisition. It also provides for valuing land at replacement value and not market value as is the status today.

The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006: It establishes a process by which forest dwellers and other forest dependent communities can claim and get their rights settled on designated forest land. A number of projects, including mining projects, are being asked to investigate forest rights, even in cases of some, who have already received forest and environmental clearances.

The Indian Boilers Act, 1923, 5 of 1923 (23rd February, 1923): It's an Act to consolidate and amend the law relating to steam boilers.

Indian Boiler (Second Amendment) Regulation, 2006: This Regulation is made under Section 28 of the Indian Boilers Act, 1923. In the Indian Boiler Regulations (1950), in Regulation 4, in clause © after sub clause (iv), (vii) for such boilers, having a capacity of 20 tonnes per hour and above, which are required to be assembled at site, the mountings may be supplied separately. All boilers of capacity less than 20 tonnes per hour shall carry all the mountings or fittings certificates in

respective forms with details mentioned in Form III issued at the time of manufacture of boilers.

Geographical Indications of Goods (Registration and Protection) Act, 1999 (No. 48 of 99): It's an Act to provide for the registration and better protection of geographical indications relating to goods. The Act defines 'Geographical Indication'. In relation to goods, it means an indication, which identifies such goods as agricultural goods, natural goods or manufactured goods as originating, or being manufactured in the territory of a country, or a region or locality in that territory, where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical origin, and in case where such goods are manufactured goods, one of the activities of either the production or of processing or preparation of the goods concerned takes place in such territory, region or locality, as the case may be.

The Geographical Indications of Goods (Registration and Protection) Rules, 2002: The Rules define application for registration of a geographical indication that includes the geographical indication for goods contained in it. The rules define the procedure for geographical indication, which serves to designate the goods as originating from the concerned territory of the country or region or locality in the country, as the case may be, in respect of specific quality, reputation or other characteristics, which are due exclusively or essentially to the geographical environment, with its inherent natural and human factors, and the production, processing or preparation of which takes place in such territory, region or locality, as the case may be.

The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended in 1988, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act on Prevention and Control of Water Pollution deals with the power of the State Government to restrict the application of the Act to certain areas; power to obtain information; power to take sample of effluents and procedure to be followed; seek reports of the result of analysis on samples taken under Section 21; power of entry and inspection; prohibition on use of stream or well for disposal of polluting matter etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by State Board; appeals; revision; power of State Board to carry out certain works; furnishing of information to State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make

application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Air (Prevention and Control of Pollution) Act 1981(as amended in 1987): This Act provides for the Prevention, Control and Abatement of Air Pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration that may be or tend to be injurious to human beings or living creatures or plants or property or environment.

Explosives Act, 1884: The Act regulates the manufacture, possession, use, sale (transport, import and export) of explosives. This Act was enacted to prevent accidents at various points of handling of explosives. It does not include any provision for prevention of crime involving explosives. The Act defines 'explosives' as any substance, whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous, used or manufactured with a view to produce a practical effect by explosion or pyrotechnic effect. The term includes gunpowder, nitro-glycerine, detonators etc. as well as fireworks and fog signals.

The Workmen's Compensation Act, 1923: It's an Act to provide for the payment by certain classes of employers to their workmen of compensation for injury by accident.

The Industrial Disputes Act, 1947 (Act no. 14 of 1947): It's an Act to make provision for the investigation and settlement of industrial disputes, and for certain other purposes.
The Act defines 'industry' as any systematic activity carried on by co-operation between an employer and his workmen (whether such workmen are employed by such employer directly or by or through any agency, including a contractor) for the production, supply or distribution of goods or services with a view to satisfy human wants or wishes (not being wants or wishes, which are merely spiritual or religious in nature), whether or not, (i) any capital has been invested for the purpose of carrying on such activity; or (ii) such activity is carried on with a motive to make any gain or profit, and includes (a) any activity of the Dock Labour Board established under Section 5A of the Dock Workers (Regulation of Employment) Act, 1948 (9 of 1948); (b) any activity relating to the promotion of sales or business or both carried on by an establishment. The Act defines 'industrial dispute' as any dispute or difference between employers and employers or between employers and workmen, or between workmen and workmen, which is connected with the employment or non-employment or the terms of employment or with the conditions of labour, of any person

The Contract Labour (Regulation and Abolition) Act, 1970 (Act no. 37 of 1970): An Act to regulate the employment of contract labour in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith. It applies to every establishment in which twenty or more workmen are employed or were employed on any day of the preceding twelve months as contract labour and to every contractor, whose employees or who employed on any day of the preceding twelve months, twenty or more workmen. The Act defined 'workman' as deemed to be employed as 'contract labour' in or in connection with the work of an establishment when he is hired in or in connection with such work by or through a contractor, with or without the knowledge of the principal employer. Further 'contractor' is defined- in relation to an establishment- as a person, who undertakes to produce a given result for the establishment, other than a mere supply of goods of articles of manufacture to such establishment, through contract labour or who supplies contract labour for any work of the establishment and includes a sub-contractor;

Explosives Rules, 1983: The Rules are framed under Section 5 and 7 of the Explosives Act, 1884 (4 of 1884) and extends to various compositions of explosives. The Rules define 'authorised explosives' as explosives included

in a list of authorised explosives published by the Central Government from time to time in the Official Gazette.

The Rules have set safety distance categories of explosives. (1) Explosives are divided into four categories according to the risks, which they present when initiated, namely, (i) Category X – those explosives, which have a fire or a slight explosion risk or both, but the effect of which will be local; (ii) Category Y – those explosives, which have a mass fire risk or a moderate explosion risk, but not the risk of mass explosion; (iii) Category Z – those explosives, which have a mass explosion risk and major missile effect, (iv) Category ZZ – those explosives, which have a mass explosion risk and minor missile effect.

The Noise Pollution (Regulation and Control) Rules, 2000: The Rules are framed with the objective of maintaining Ambient Air Quality Standards in respect of noise and in view of increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices, which have deleterious effects on human health and the psychological well being of the people. The Rules define 'area/zone' as all areas, which fall in any of the four categories given in the Schedule annexed to these rules, namely, Industrial area, Commercial area, Residential area and Silence Zone. The Act defines 'person' in relation to any factory or premises as a person or occupier or his agent, who has control over the affairs of the factory or premises.

The Rules define 'Ambient Air Quality Standards' in respect of noise for different areas/zones. It made provision for the State Government to categorise the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas.

The Rules dated 14th February 2000 have been amended vide notification S.O. 1046 (E) dated 22nd November, 2000. These rules are called the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000. The amendment defines 'authority' as any authority or officer authorised by the Central Government, or as the case may be, the State Government in accordance with the laws in force and includes a District Magistrate, Police Commissioner, or any other officer not below the rank of the Deputy Superintendent of Police, designated for the maintenance of ambient air quality standards in respect of noise under any law for the time being in force. The amendment also defines 'Silence zone' as an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area, which is declared as such by a competent authority.

The Noise Pollution (Regulation and Control) Rules, 2000: Noise pollution includes "fire crackers, sound producing instruments", besides "construction activity". In sub-clause (ii), for the words, "public address system, appliances or apparatus", the words "public address system, horn, appliances or apparatus" have been substituted.

Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O 1088 (E) dated the 11th October 2002. The Amendment directs the State Government to reduce noise pollution, permit use of loud speakers or public address systems during night hours (between 10.00 p.m. to 12.00 midnight) on or during any cultural or religious festive occasion of a limited duration, not exceeding fifteen days in all during a calendar year.

Amendment vide S.O. 1569 (E) dated the 19th September 2006 provides directions for the State Pollution Control Board (in consultation with Central Pollution Control Board) for collection, compilation, and publication of technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.

The Noise Pollution (Regulation and Control) (Amendment) Rules, 2009: The Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, vide notification 11th January, 2010. The amendment in Rule 5 provides for restrictions on the use of horns, sound emitting construction equipments and bursting of fire crackers. Further, sound emitting construction equipments shall not be used or operated during night time (defined as period between 10.00 PM-6:00 AM) in residential areas and Silence Zones.

Gas Cylinders Rules, 1981: The Rules regulate possession, delivery, dispatch, handling, examination and testing of gas cylinders.

Static and Mobile Pressure Vessels (Unfired) Rules, 1981: The Rules regulate the construction, fitment, storage, loading, transport, licensing and inspection of pressure vessels intended for storage and transport of any compressed gas including Liquefied Petroleum Gas. The administration of the Act requires interaction with the Ministries of Coal, Mines, Petroleum, Environment and Home Affairs. The manufacturing industry for explosives is licensable under the Industries (Development and Regulation) Act, 1951.

Notifications under the Explosives Act, 1884: The Notification No. M-1217, dated 20th November, 1926 was issued in exercise of the powers conferred by Section 17 of the Indian Explosives Act, 1884 (IV of 1884), and in supersession of the Commerce and Industry Department Notification No. 12455, dated the 20th October, 1917, wherein the Governor-General-in-Council declared that picric acid, picrates and mixtures of picric acid shall be deemed to be explosives within the meaning of the said Act with exceptions.

Industries Development and Regulation Act, 1951 (Act No. 65 of 1951): It's an Act to provide for the development and regulation of certain industries**.** The Act has provision for imposition of cess on scheduled industries in certain cases - (1) These may be levied and collected as a cess for the purposes of this Act on all goods manufactured or produced in any such scheduled industry as may be specified on this behalf by the Central Government by notified order, a duty of excise at such rate as may be specified in the notified order, and different rates may be specified for different goods or different classes of goods.

The Salt Cess Act, 1953: This Act seeks to provide for the levy and collection of a Cess on salt for the purpose of raising funds to meet the expenses incurred on the salt organisation maintained by the Government and on the measures taken by the Government in connection with the manufacture, supply and distribution of salt, unless the context otherwise requires.

The Act defines that the word 'manufacture', in relation to Salt, includes collection, removal, preparation, steeping, evaporation, boiling or any one or more of these processes, the separation or purification of salt obtained in the manufacture of saltpeter, the separation of salt from earth or other substance, so as to produce alimentary salt, and the excavation or removal of natural saline deposits or efflorescence; and the word 'manufacturer' shall be construed accordingly and shall include not only a person, who employs hired labour in the production or manufacture of salt, but also any person, who engages in its production or manufacture on his own account if the salt is intended for sale.

The Export (Quality Control and Inspection) Act, 1963, (No. 22 of 1963) as amended by Export (Quality Control and Inspection) Amendment Act, 1984 (No. 40 of 1984): It's an Act to provide for sound development of the export trade of India through quality control and inspection and for matters connected therewith. The Act defines 'Inspection' that, in relation to a commodity, means the process of determining whether a batch of goods in that commodity complies with the standard specifications applicable to it or any other specifications stipulated in the export contract, generally, by inspecting either

the whole batch or a selected sample or samples, which purport to represent the whole batch. The Act also defines 'quality control', as any activity having as its object, the determination of the quality of a commodity whether during the process of manufacture or production or subsequently in order to ascertain whether it satisfies the standard specifications applicable to it or any other specifications stipulated in the export contract and whether it may be accepted for purposes of export.

Special Economic Zones (SEZ) Act, 2005 (No. 28 of 2005): SEZ is an Act to provide for the establishment, development and management of the Special Economic Zones for the promotion of exports and for matters connected therewith or incidental thereto.

A Special Economic Zone may be established under this Act, either jointly or severally by the Central Government, State Government, or any person for manufacture of goods or rendering services or for both or as a Free Trade and Warehousing Zone.

The areas falling within the Special Economic Zones may be demarcated by the Central Government or any authority specified by it as- (*a*) the processing area for setting up units for activities, being the manufacture of goods or rendering services; or (*b*) the area exclusively for trading or warehousing purposes; or (*c*) the non-processing area for activities other than those specified under clause (*a*) or clause (*b*).

The Foreign Trade (Development and Regulation) Act, 1992, Act No. 22 of 1992. (7th August, 1992): It's an Act to provide for the development and regulation of foreign trade by facilitating imports into, and augmenting exports from India and for matters connected therewith or incidental thereto.

The Water (Prevention and Control of Pollution) Cess Act, 1977 (Amended 1992 and 2003): It's an Act to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

Cement Cess Rules, 1993: Cement Cess Rules, 1993, Ministry of Industry (Department of Industrial Development), No. S.O 126 (E), have been set up as required by Sub-section (1) of Section 30 of the Industries (Development and Regulation) Act, 1951 (65 of 1951). These rules define the 'Cess' as Cess levied and collected in terms of Order No. S.O 125 (E), dated 24th February, 1993 of Department of Industrial Development, issued under Sub-section (1) Section 9 of the Act. Further, it defines 'cement' as any variety of cement manufactured in India, and includes Portland Pozzolana cement, blast furnace slag cement, water-proof (hydrophobic) cement, rapid hardening cement, low heat cement, masonry cement, high strength ordinary Portland cement, oil-well cement and white cement. It also defines 'manufacturer' as any cement plant producing cement, excluding cement plants of capacity less than 99000 tonnes per annum based on rotary kiln and 66000 tonnes per annum based on vertical shaft kilns.

Hazardous Wastes (Management and Handling) Rules, 2008: Ministry of Environment and Forests has notified the Hazardous Waste (Management, Handling and Trans-boundary movement) Rules, 2008, repealing earlier rules so as to make the Rules more practical and effective in implementation. The National Hazardous Waste Management Strategy is being finalised for effective management of hazardous wastes so as to avoid environmental pollution and adverse effects due to improper handling and disposal. A Coordination mechanism for effective implementation of Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 by the custom authorities at the ports has been established.

Environment Impact Assessment (EIA) Notification, September 14, 2006: Undertaking mine level Environment Impact Assessment and formulating Environment Management Plan (EMP) is mandatory for seeking Environmental Clearance (EC) under EIA Notification, 2006. Mining projects that have a lease area of more than 50 hectares in size are classified under Category A and need Environment Clearance from National level Environmental Impact Assessment Authority created with MoEF in Government of India. Mining projects that have a lease area between 5 to 50 hectares are classified as Category B projects and require Environment Clearance from State Environment Impact Assessment Authority created with respective State Department of Environment in the State Government. Mine leases smaller than five hectares in size are not covered under the Environment Clearance process initiated by EIA Notification, 2006.

The projects/activities listed for prior environment clearance included in the Schedule attached to the said Notification are: 1. Mining, extraction of natural resources and power generation (for a specified production capacity). These include are Mining of minerals, Offshore and onshore oil and gas exploration, development and production, River Valley Projects, Thermal Power Plants, Nuclear Power Projects and processing of nuclear fuel. 2. Primary Processing includes Coal washeries and Mineral beneficiation. 3. Materials Production includes Metallurgical industries (ferrous and non ferrous) and Cement plants 4. Materials processing includes Petroleum refining industry, Coke oven plants, Asbestos milling and asbestos based products, Chlor-alkali industry, Soda ash Industry, and Leather/skin/hide processing industry. 5. Manufacturing/Fabrication includes Chemical fertilisers, Pesticide industry and pesticide specific intermediates (excluding formulations), petro-chemical complexes (industries based on processing of petroleum fractions and natural gas and/or reforming to aromatics), Man-made fibre manufacturing, Petro-chemical based processing (processes other than cracking and reformation and not covered under the complexes), Synthetic organic chemical industry (dyes and dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals; other synthetic organic chemicals; and chemical intermediates), Distilleries, Integrated paint industry, Pulp and paper industry, excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching, Sugar Industry, and Induction/arc furnaces / cupola furnaces 5TPH or more. 6. Service sectors are Oil and gas transportation pipe line (crude and refinery/petro-chemical products), passing through national parks / sanctuaries/ ecologically sensitive areas including LNG Terminal, Isolated storage and handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 and 3 of MSIHC Rules, 1989, amended in 2000). 7. Physical Infrastructure including Environmental Services are Air ports, Industrial estates/parks/complexes/areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes, Common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) and Common Effluent Treatment Plants (CETPs).

The said Notification has set Specific Condition (SC) for appraisal of Industrial projects for Environment Clearance, which are "If any Industrial Estate/Complex/Export processing Zone/Special Economic Zone/Biotech Parks/Leather Complex with homogeneous type of industries, such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre-defined set of activities (not necessarily homogeneous), obtains prior environmental clearance, individual industries including proposed industrial housing within such estates/complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the

Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate)."

EIA Notification dated 14th September, 2006 and Subsequent Amendments– Clarification Regarding EIA Clearance for Change in Product-Mix: The MoEF had issued Interim Operational Guidelines on 13th October, 2006. Further to these Guidelines, the following clarification was issued for Environment Clearance for the category of products involving change in Product-Mix. It clarifies that (1) in cases of change in Product-Mix, changes in the quantities or numbers of products may be allowed without prior Environmental Clearance by the concerned State Pollution Control Board, provided such changes in the quantities of products are in the same category and are within the previously granted overall total limits and (2) projects involving modernisation of the existing unit with increase in the total production capacity beyond the threshold limit specified in the Schedule to the Notification, through change in process or technology or change in the Product-Mix or debottle-necking or a combination of these involving increase in pollution load, will obtain prior Environment Clearance from the concerned regulatory authority under the EIA Notification, 2006. MoEF Circular vide file no J 13011/81/2006-IA II (I), dated 6th February, 2007 clarified regarding consideration of integrated projects for Environment Clearance by Expert Appraisal Committee. It states that Industry projects with mining component will be considered by the 'Industry Committee' and stand alone mining projects will be considered by the 'Mining Committee'.

Office memorandum of Ministry of Environment and Forests, Government of India vide J. 11013/41/2006-IA.II (I) dated April 06, 2011:

The said memorandum stipulates 'Additional Conditions' in respect of Mega Projects already granted Environmental Clearance in accordance with the recommendations contained in the Report of the Monitoring Committee constituted to examine the issues relating to monitoring of projects (hosted on MoEF website) and their acceptance by the Competent Authority, it has been decided that henceforth all Mega Projects, namely: (i) Coal based thermal power plant with a capacity of 500 MW and above; and (ii) Cement plant with a capacity of three million Tons Per Annum and above, which have already been accorded environmental clearance, besides effectively complying with the conditions stipulated in the environment clearance letter issued to the respective projects, shall also comply with the following additional conditions:

(i) Continuous monitoring of stack emissions as well as Ambient Air Quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures as may be required from time to time shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.
(ii) The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data shall also be submitted to respective State Pollution Control Board/UTPCCs and the Regional Office of MoEF.
(iii) The Ambient Air Quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.

State Level Policies / Regulations

Industrial Policy, 2004: The Industrial Policy serves as a guideline for: Achieving the

objective of uniform growth of industry and service sector throughout the State; Dispersing industries and service sector activities; Culling together ingredients of an Industrial Policy so as to facilitate generation of employment opportunities for local resource owners and stakeholders; Clearly stating Government's commitment and approach to the development of key infrastructural sectors like Power, Housing, Social Infrastructure Development, Human Resource Development and Vocational Education so as to create a congenial investment climate for existing industry to grow as well as to attract further investments in the State; Clearly spelling out Industrial Incentives of fiscal nature, specifically to address the issues impeding industrial growth, such as procedures for setting up of industry; Obtaining permissions required under various Labour Laws; and Addressing issues related to transportation of industrial produce so as to lay the foundation of strong and consistent growth of the industrial sector. It is expected that 'State of Art Technology' is used to ensure least environmental degradation. In addition to other conditions, while granting the lease, the environmental clearance and clearance under Forest Conservation Act, 1980 etc. are required as provided in the rules. As per present Policy of the State, at least 50 percent of clinker or any other percentage as prescribed by the Government has to be converted into cement through grinding units located in the State. The cement plant will be eligible for incentives as per the Industrial Policy of the State and Central Government prevalent at the time of coming into production. Further, the applicant shall be required to meet the conditions of employment of at least 70 percent of *Himachalis* as prescribed in the Industrial Policy Guidelines 2004 and as amended from time to time.

Forest Sector Policy, 2005: The Forest Sector Policy seeks to achieve Sustainable Forest Management in Himachal Pradesh, i.e., forests, watersheds, wildlife, biodiversity and habitats, for the maintenance and rehabilitation of its environment and strive for enhanced livelihoods for the people of the State, especially women and other resource poor groups.

Within the framework of the National Forest Policy, 1988, the basic objectives of the Forest Sector Policy of Himachal Pradesh are to conserve and improve the status of natural resources in the State, especially forests, wildlife and biodiversity through effective watershed management practices and strive towards appropriate land use in the State, especially in the context of Sustainable Forest Management, focusing on other primary land use sectors, such as agriculture, horticulture, animal husbandry and those related to infrastructure development.

The Forest Sector Policy, 2005 has outlined following broad strategies:

- The Himachal Pradesh Forest Department (HPFD), in consultation with other stakeholders, will devise criteria and mechanisms to assess and categorise the State's forests into conservation, production, community and urban forests. Necessary modifications in the working plan code will be made to accordingly reorganise these forests in a time bound manner and make provisions for periodically reviewing such categories.
- The uniqueness of Himachal Pradesh as a Hill State and its unique physical and ecological status, especially those areas that are uncultivable needs to be explained in reference to the National Forest Policy for justifying the extent of forest and tree cover and will be taken up with the Central Government.
- A coordinated and collaborative effort from all land using sectors will be made to achieve and enhance the target of 35.5 percent forest and tree cover through measures, such as reforestation and afforestation, agro forestry, farm forestry and utilising marginal and private lands for fodder development.

Section 6.12 of the said Policy describes 'Industry, Mining and Hydel Projects'.

It mandates clearance from the Forest Department, concerned *Gram Sabha* and *Panchayats* at appropriate levels for industries, especially having impact on the forest sector including mining and hydel projects in all cases involving forest and forest land. Further, the current Environment Impact Assessments, and forest clearances for industry/ mining/hydel projects do not take into account loss of forest use to village communities. The Central Government will be approached for necessary amendments in the guidelines under the Forest Conservation Act, 1980 and the notifications under Environment Protection Act. The said Section sets strategies for implementing policy directives. A resolution from the *Gram Sabha*, a 'No Objection' from the Forest Department and advance payment for rehabilitation of the areas to be mined will be prerequisites for granting a mining lease. Necessary amendments in the *Panchayat* laws as well as Mining laws will be carried out in this regard. Environmental Cess will be levied on the Mining lessee by the concerned *Panchayat*. *Panchayat* laws needs to be amended in this regard. Systems for transparency and participatory monitoring by communities and/or other stakeholders of industries, especially those having impact on the forest sector including mining and hydel projects, will be introduced. The Central Government will be approached for necessary amendments in the guidelines under the Forest Conservation Act, 1980 and the notifications under Environment Protection Act. Participatory mechanisms for planning, implementation and monitoring of Catchment Area Treatment plans (CAT Plans) for hydel projects and mine management plans for Mining areas will be introduced. Special cost norms in the mountain context will be developed for rehabilitation of mined areas, dumping sites and other problem areas, such as land slide prone areas and cloud burst affected areas. The plans including the compensation packages will give due consideration to loss of forest use to village communities.

Section 6.10 of the said Policy describes 'Forest Based Industries'. It mandates that the Government will develop incentives to encourage wood based enterprise to procure raw material from sources other than Government forests. The wood based industries in rural areas will be regulated through *Gram Sabhas*. Special attention will be given to value addition and diversification of wood and forest based products.

State Water Policy: The Policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan, keeping in view the existing agreements/awards for a basin or a sub-basin, so that the best possible combination of options can be selected and sustained."

The Policy recommends watershed management through extensive soil conservation, CatchmentArea Treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water resources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

Water quality is impacted by untreated or inadequately treated industrial effluents and

sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation, ecology, afforestation / biodiversity / tourism, agro-industries, hydro-power, non-agro-based industries, and navigation and other uses.

The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implementing the provisions of the Act, may (a) issue guidelines for adoption of Rain Water Harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural and urban areas; (d) undertake Information, Education and Communication activities including workshops, seminars, public discourses, debates, radio and television programmes to promote rain water harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of Rain Water Harvesting for ground water recharge in the notified areas, provided that in urban areas within the notified area, no directions issued under these rules shall be applicable for construction of Rain Water Harvesting Structures: (a) in residential or commercial premises having plinth area of less than 100 square metres; or (b) in the sinking zones, where construction of rain water harvesting structures would be detrimental to the safety of the building structures in the area.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act states about framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the functions, which includes (a) mobilising voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identification of beneficiaries for the implementation of developmental schemes pertaining to the village; (c) rendering assistance in the implementation of developmental schemes pertaining to the village.

- Approve plans, programmes and budget prepared by the *Gram Panchayat*, for economic development and social justice.
- Authorise, after being satisfied, issuance of utilisation certificates for funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as

defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for the maintenance and repair (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the Gram *Panchayat*, at the village level; (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Chapter-XII of this Act describes the preparation of development plans and District Planning Committee. The preparation of development plans entails that (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) Every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the *Zila Parishad, Panchayat Samitis, Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

The Himachal Pradesh Shops and Commercial Establishments Act, 1969 and Amended Act, 2004. (Act No-15 of 2004): The Act shall apply, in the first instance, to the limits of the Shimla Municipal Corporation and to the Municipal areas and cantonment limits; but the Government may, by Notification in the Official Gazette, direct that it shall come into force in any other local area or shall apply to such establishments or of class of establishments in such other areas as may be specified in the Notification. The Act defines 'commercial establishment' as any premises wherein any business, trade or profession is carried on for profit, and includes journalistic or printing establishment and premises in which business of banking, insurance, stocks and shares, brokerage or produce exchange is carried on or which is used as hotel, restaurant, boarding or eating house, theatre, cinema or other place of public entertainment or any other place, which the Government may declare, by notification, to be a commercial establishment for the purpose of this Act.

Himachal Pradesh Bricks (Control) Act, 1969 (Act No. 29 of 1969): It's an Act to regulate the manufacture, storage, distribution transport, acquisition and disposal of bricks in the State of Himachal Pradesh and for matters connected therewith. The Act defines 'Brick' as any piece of burnt clay fired in kiln and having a geometrical shape. The Act gives powers to control manufacture, storage, distribution etc. of bricks, if the Government is of opinion that it is necessary or expedient to do so for maintaining or increasing the supply of bricks for securing their equitable distribution and availability at fair prices, it may, by order, notify in the Official Gazette, and provide for (a) regulating by licenses, permits or otherwise the manufacture, storage, distribution, transport, acquisition or disposal of bricks; (b) collecting any information or statistics with a view to regulating the aforesaid matters; (c) granting issue of licenses, permits or other documents and the charging of fees, therefore; (d)

controlling the prices at which bricks may be bought or sold; (e) requiring dealer or kiln owners to maintain and produce for inspection such accounts and records regarding bricks and to furnish such information relating thereto, as may be specified in the order; (f) any incidental and supplementary matters including the entering and search of premises and vehicles and the seizure by a person authorised to make such search of the bricks in respect of which such person has reason to believe that contravention of any order made under this Act has been, is being or is about to be committed.

The Himachal Pradesh Industrial Establishments (National and Festival Holidays and Casual and Sick Leave) Act, 1969. (Act No. 7 of 1970): It's an Act to provide for the grant of national and festival holidays and casual and sick leave to persons employed in Industrial Establishments in Himachal Pradesh. The Act defines Industrial establishment as any factory as defined in clause (m) of Section 2 of the Factories Act, 1948, (63 of 1948), or any place, which is deemed to be a factory under Sub-section (2) of Section 85 of that Act; or (ii) any plantation as defined in clause (f) of Section 2 of the Plantations Labour Act, 1951, (69 of 1951).

The Himachal Pradesh Fire Fighting Services Act, 1984 (Act No. 30 of 1984): It's an Act to provide for the maintenance of effective fire fighting service in the State of Himachal Pradesh.

The Himachal Pradesh Factories (Control of Dismantling) Act, 1973 (Act No. 6 of 1974): It's an Act to control the dismantling of factories in Himachal Pradesh. The Act defines, (a) "to 'dismantle' a factory means to remove from its position, the machinery or part of the machinery of the factory, whereby such removal is rendered wholly or partly useless for its purposes; but does not include any temporary removal within the premises of the factory of the machinery or part of the machinery for purposes such as adjustment, cleaning and repairs;" (b) 'factory' means a factory as defined in clause (m) of Section 2 of the Factories Act, 1948, (63 of 1948), and includes a small scale industry unit with a capital investment of not more than Seven Lakhs and Fifty Thousand Rupees (Rs. 7,50,000), irrespective of the number of persons employed.

The Himachal Pradesh Electricity (Duty) Act, 1975 (Act. No. 11 of 1975): This is an Act to levy duty on the sale or consumption of electric energy in Himachal Pradesh. It defines (b) 'consumer' as any person or establishment, who uses or consumes energy and includes industrial consumer, i.e., any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage below 11 KV; industrial consumers, i.e., any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage from 11 KV to 33 KV; industrial consumers, i.e., any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage above 33 KV.

The Act sets levy of electricity duty on consumption of energy. There shall be levied and paid to the State Government on the energy consumed, a duty to be called the 'Electricity Duty' in the prescribed manner and computed at the following rates in case of industrial consumers having supply voltage below 11 KV, at the rate of 33 paise per unit; in case of industrial consumers having voltage from 11 KV to 33 KV, at the rate of 35 paise per unit; and in case of industrial consumers having supply voltage above 33 KV, at the rate of 45 paise per unit.

The Himachal Pradesh Essential Services (Maintenance) Act, 1973: It's an Act to make provisions for the maintenance of certain essential services. The Act defines 'Employment' as employment of any nature and whether paid or unpaid. This Act shall apply to (i) any employment or class of employment under the State Government; which the State Government may, by notification in the Official Gazette, specify; and

(ii) any other employment or class of employment, which the State Government, being of opinion that such employment or class of employment is essential for securing the public safety, the maintenance of public order, health or sanitation, or for maintaining supplies or services necessary for the life of the community, may, by notification in the Official Gazette, declare to be an employment or class of employment to which this Act applies.

The Act regulates wages and conditions of service. The State Government may make rules regulating or empowering a specified authority to regulate wages or other conditions of service of persons or of any class of persons engaged in any employment declared under Section 3 to be an employment or class of employment to which this Act applies.

Himachal Pradesh Infrastructure Development Act, 2001: The Act shall apply to such Infrastructure Projects as are implemented by a Government agency through Private Sector partnership under the provision of this Act and fall in the category of infrastructure projects specified in Schedule-I and such other infrastructure projects as are notified by the State Government, by notification, from time to time.

The Himachal Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971): It's an Act to encourage the development of industries in Himachal Pradesh by the grant of State aid. The Act defines 'industry' as any industrial business or enterprise conducted or undertaken either by an individual or by a company, association or body of individuals, whether incorporated or not; 'cottage industry' as any industry that is carried on in a place, which is not a factory for the purposes of the Factories Act, 1948; 'village industries' as any industry, which forms the normal occupation, whether whole-time or part-time, of any class of the rural population of the State; 'machinery' includes plant, apparatus, tools and other appliances required for the purpose of carrying on any industrial operation or process. The Act provides for carrying out the purposes of this Act, the State Government shall, as soon as possible, after the commencement of this Act, establish Board to be called the 'Board of Industries'. The said Board was constituted vide Notification. No. 7-2/73-SI (Loan) dated the 31st August, 1973.

The Act describes general provisions regarding the giving of State Aid. It delineates Form of State aid, Industries to which several forms of State aid may be given and application for State Aid. The Act has provisions regulating the giving of State Aid otherwise than by the supply of machinery of the hire-purchase system.

Notifications and Rules under the Himachal Pradesh State Aid to Industries Act, 1968. The Himachal Pradesh State Aid to Industries Rules, 1971, Industries Department Notification, the 22nd February, 1973: In exercise of the powers conferred by Section 46 of the Himachal Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971), the Governor, Himachal Pradesh, made the rules for the purposes of the said Act, the same having been previously published vide this Government Notification of even number, dated the 19th January, 1973. It describes procedure for Application for State Aid Loans

Himachal Pradesh State Aid to Industries Rules, 1972: Date of Commencement of the Act, Industries Department Notification No. 9-7/71-SI (Loans): In exercise of the powers conferred by Sub-section (3) of Section 1 of the Himachal Pradesh State Aid to Industries Act, 1968 (2 of 1971), the Himachal Pradesh Government, hereby, appoints 19th January, 1973 as the date on which the said Act shall come into force.

Constitution of the Board, Industries Department Notification, 31st August, 1973: The Governor, Himachal Pradesh constituted a board to be called the 'Board of Industries' consisting of the following members for carrying out the purposes of the Himachal

Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971).

Rules Regarding Grant of Incentives, Concessions and Facilities to Industrial Units in Himachal Pradesh, 2004: The objectives of the incentives, concessions and facilities being provided under these rules are to: achieve the aims and objectives announced by the Government in the Industrial Policy Guidelines from time to time; spell out the extent to which the State Government proposes to provide benefits, incentives, concessions and facilities to industrial enterprises to be set up in the State, on or after the appointed day, to supplement and support the Special Package of Incentives and Concessions announced by the Government of India on 7th of January, 2003 for industrial enterprises to be set up in Himachal Pradesh; encourage investment and optimum utilisation of the resources of the State, namely, power, land, capital, manpower and raw material in terms of revenue generation and generation of employment opportunities for local populace within the physical and environmental carrying capacities of the State; facilitate the ease of doing business by simplifying the Rules and to promote transparency of procedures governing the establishment of Industrial Enterprises in the State, and to encourage the maximum gainful employment of bonafide *Himachalis* in the Industrial Enterprises set up in the State.

The Himachal Pradesh *Khadi* and Village Industries Board Act, 1966: The Act provides for the establishment of a Board for the development of *Khadi* and Village Industries in the areas (as comprised in Himachal Pradesh immediately before 1st November, 1966). The functions of the board are to promote, encourage and assist in the development of *khadi* and village industries and to carry on trade or business in the products of such industries; to provide work to persons, who have been professionally engaged in *khadi* and village industries; to grant loans to individuals societies or institutions engaged in *khadi* and village industries on such terms as may be prescribed; to encourage establishment of co-operative societies in *khadi* and village industries; to conduct training programmes with a view to impart the necessary skill and knowledge for carrying on *khadi* and village industries; to manufacture tools and implements and to arrange supply of such tools and implements and raw materials in order to secure development of *khadi* and village industries; to conduct publicity and propaganda and to organise marketing of finished products of *khadi* and village industries by opening stores, shops, emporia and holding exhibitions; to undertake and encourage research with a view to improve the quality and marketability of *khadi* and other products of village industries; to collect statistics relating to *khadi* and village industries from such person or persons as may be prescribed and to publish the statistics so collected; and to carry out other matter, which may be prescribed.

The Himachal Pradesh Co-operative Societies Act, 1968: The Act regulates registration with limited or unlimited liability, restrictions on holding of shares, societies to be corporate bodies; Amendment of bye-laws of a Co-operative society; Amalgamation, transfer of assets and liabilities; Conversion and division of societies; Cancellation of registration certificate of Co-operative societies in certain cases; Restriction on transfer of shares or interest; Transfer of interest on death of a member; Disposal of share or interest of expelled, resigned or insane member; Members to furnish information as to their financial position and alienation of their immovable property; Nominees of the Government on the committee of Cooperative society; Charge on immovable properties of members borrowing loans from certain societies; Acts of Co-operative societies not invalidated by certain defects; Liability of a Government servant in connection with the affairs of a Co-operative society; Savings of existing society; and appointment of a Co-operative Appellate Tribunal.

Recycled Plastics (Manufacture and Usage) Rules, 2003: As per the provisions of the Recycled Plastics (Manufacture and Usage)

Rules, 2003, every occupier manufacturing carry bags or containers of virgin plastic or recycled plastic or both shall have to get registered with the State Pollution Control Board.

Other Sub-programmes /Strategies /Projects

Zoning Atlas and Associated Activities: Apart from its regulatory role, the State Pollution Control Board is undertaking a pro-active visionary approach by making use of scientific tools, such as Geographical Information System (GIS) application for environment management etc. To undertake the Spatial Environmental Planning Programme, the State Board has a state of art facility in terms of infrastructure and technical manpower. It has so far covered all the districts under Zoning Atlas for siting of Industries. In addition, the State Board has also taken lead towards revising all these Zoning Atlases as per the modified criteria devised by the Central Pollution Control Board and the Ministry of Environment and Forests, Government of India and, consequently, more sites are available now for Sustainable Industrialisation. The summary of the activities undertaken/being undertaken by the State Board in order to achieve the objectives of sustainable industrialisation are as follows:

1. Zoning Atlas for siting of Industries for all districts of the State.

2. Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur.

3. State Environmental Atlas of Himachal Pradesh.

4. District-wise Environmental Atlas for Solan, Sirmaur, Kangra, Mandi and Hamirpur and remaining districts are also being covered.

The Central Pollution Control Board, in consultation with the State Pollution Control Boards, has identified 24 areas in the country as critically polluted areas. In Himachal Pradesh, Kala-Amb and Parwanoo are identified as critically polluted areas.

Special Package of Incentives to Himachal Pradesh: In January 2003, the Government of India announced a special package of incentives to Himachal Pradesh. This includes 100 percent exemption from payment of Central Excise Duty for 10 years; 100 percent income tax exemption for five years and 25 and 30 percent exemption for the next block of five years (for Individuals and Companies); capital investment subsidy @ 15 percent of investment in Plant and Machinery, subject to a ceiling of Rs. 30 *lakhs*, and, enhancement of funding pattern under Centrally sponsored schemes, like *Deen Dayal Hathkargha Protsahan Yojana* and Prime Minister *Rojgar Yojana*. Apart from these, the Central Transport Subsidy is being provided to industrial units @ 75 percent of the cost of transportation of their finished goods and for transportation of their raw material from the location of their units anywhere in the State to the nearest, specified broad gauge rail head.

The Government of India has also announced a special package of incentives for Himachal Pradesh and Uttarakhand, broadly along the lines of Jammu and Kashmir. It provides for concessions aimed at attracting new investments to these States. It will be a conscious policy of the Government to supplement this package with certain concessions and facilities from the State Government so as to ensure Sustainable Industrial Development in the long run.

The State Government has set up a State Level Single Window Clearance and Monitoring Authority under the chairmanship of the Chief Minister to consider and give Government approvals, in principle, to the medium and large scale projects in the State and to ensure optimum inter-departmental co-ordination. The State has also set up Single Window Agencies at major industrial towns like Parwanoo, Baddi, Paonta Sahib, Goalthai and

Sansarpur Terrace to facilitate speedy clearances and assist entrepreneurs in obtaining various clearances to set up their projects. The State Government, through these Single Window Agencies, will not only ensure initial approvals to set up the project, but also look into the requirements of obtaining further licenses necessary to commence production. It will also assist in obtaining all necessary State Government Departments related approvals from the concerned Departments. To facilitate clearances and monitoring of projects in the State and to make it transparent and user friendly, these agencies will be actively encouraged to use Information Technology in their working and discharge of their functions. The services being offered by these agencies would be adequately highlighted through Industrial Associations and for a, like PHDCCI, FICCI, ASSOCHAM, CII etc. as channels for providing information to industry. The State Government would actively consider preparing and finalising a separate framework for effective implementation of the Single WindowSystemwithaviewtomakeSingle Window Clearances, a statutory requirement.

Health Vision, 2008: The health vision 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for attainment of targets. The primary goal of vision 2008 is to achieve the status 'Health for All'. Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen existing system to address environmental health issues in the State, particularly Liquid Waste Disposal, Hospital Bio-Medical Waste Management, Solid Waste Management and Excreta Disposal.

Ongoing initiatives of NAPCC

- **Power Generation:** The Government is mandating the retirement of inefficient coal-fired power plants and supporting the research and development of IGCC and supercritical technologies.
- **Renewable Energy:** Under the Electricity Act 2003 and the National Tariff Policy 2006, the Central and the State electricity regulatory commissions have stated that States must purchase a certain percentage of grid-based power from renewable sources.
- **Energy Efficiency:** Under the Energy Conservation Act 2001, large energy consuming industries are required to undertake energy audits, and an energy labelling programme for appliances has been introduced.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria: (a)The project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the empowered committee may relax this eligibility criterion; (b) International Convention Centres and other tourism infrastructure projects; provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the 'total project cost'. Viability Gap Funding, under this scheme, will normally be in the form of a

capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 *crores* (Rs. One Hundred *Crores*) for each project may be sanctioned by the Empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *crores* (Rs. Two Hundred *Crores*) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 *crores* may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

The Draft Himachal Pradesh Industrial Renewal and Revival Scheme, 2004: The 2004 Scheme will be operated by the Department of Industries of the Government of Himachal Pradesh for the rehabilitation or revival of industrial units in the State. The 2004 Scheme shall be applicable to all 'Closed'/'Sick'/'Weak' units as defined, proposing the rehabilitation or revival of such units and also to the expansion in respect of registered 'Closed', 'Weak' or 'Sick' units, if forming a part of such rehabilitation or revival proposals as accepted by the State Government. Such registered units can be in the Private Sector, Co-operative Sector and/or Joint Sector.

Incentives disbursed to such units under any earlier incentive schemes shall continue to be governed by the provisions of the registration and sanctions already issued under the respective schemes; provided further that sick units that have been registered and for which eligibility certificates have been issued in terms of any other incentive scheme, but in respect of which no incentives have been actually disbursed, may opt for registration under the 2004 scheme, if the rehabilitation or revival proposals, otherwise, fulfill the terms and conditions under the 2004 Scheme.

Centrally Sponsored Schemes

Transport/ Freight Subsidy: This is a 100 percent Centrally sponsored scheme wherein eligible industrial units are given subsidy @ 75 percent on the transportation costs paid on raw materials and finished goods from the location of the unit to the nearest railway heads and vice-versa. It is applicable to all eligible industrial units for a period of five years from the date of commencement of commercial production. Prior to 2004-05, this scheme was being implemented on the basis of 100 percent reimbursement from Government of India. This scheme was to continue up to 31.3.2007, but now this scheme has been extended further. Himachal Pradesh State Industrial Development Corporation, (H.P.S.I.D.C) has been declared as nodal agency for disbursement of claims on account of transport subsidy under this scheme.

Central Capital Investment Subsidy: The Government of India has announced a Special Package of Incentives for Himachal Pradesh on 7.1.2003 wherein all the new industrial units in notified locations are eligible for capital investment subsidy @ 15 percent of their investment in plant and machinery, subject to a ceiling of Rs. 30.00 *lakhs*. The existing units are also entitled to this subsidy on their substantial expansion.

Deen Dayal Hathkargha Protsahan Yojana: *Deen Dayal Hathkargha Protsahan Yojana* is a Centrally sponsored handloom scheme introduced in 2000-01. This scheme has replaced the project package scheme. This is a centrally sponsored scheme shared by Centre and State on 50:50 basis (90:10 for certain components like training to weavers, margin money, design development etc.). In case of implementing agencies where 100 percent beneficiaries belong to SC/ST/Women/Minority category, the funding pattern is 75:25 (Centre:State). As per the new package of incentives announced by Government of India to Himachal Pradesh on the pattern of North-Eastern States, Jammu & Kashmir and Uttarakhand, the funding pattern has been changed to 90:10 (Centre:State).

Work Shed: This is a centrally sponsored scheme, which is being funded by the Centre and the State on sharing basis in the ratio 7:1.

Under this scheme, the financial assistance is being provided to the rural weavers, who have no proper working place and earn at least 50 percent of their earnings from weaving, for construction of work-shed. Initially, the funding pattern of this scheme was 80:20, which was revised as 87.5:12.5. Under this scheme, a work-shed of Rs. 9000 is constructed for which Rs. 7000 are provided by the Government of India (GoI), Rs.1000 by the State Government and Rs.1000 by the beneficiary.

Office Memorandum No.1(10)/2001-NER Government of India, Ministry of Commerce and Industry (Department of Industrial Policy and Promotion), New Delhi, dated 7th January, 2003: The memorandum is concerned with the New Industrial Policy and other concessions for the States of Uttaranchal and Himachal Pradesh. It provides the package of incentives for the two States. The memorandum outlines fiscal incentives to new industrial units and to existing units on their substantial expansion, and development of industrial infrastructure. Other incentives include *Deen Dayal Hathkargha Protsahan Yojna* and incentives offered by the Ministry of Textiles. The funding pattern between Government of India and both the States would be changed from 50:50 to 90:10 under this scheme. The Ministry of Textiles would extend its package of incentives to Himachal Pradesh, which is included in the difficult area category. The Ministry of Food Processing Industries would also include Himachal Pradesh in the difficult area category. *Pradhan Mantri Rozgar Yojana (PMRY)* - the Ministry of Agro and Rural Industries would provide for the State of Himachal Pradesh relaxation under PMRY with respect to age (i.e., 18-40 years from 18-35 years) and Subsidy @ 15 percent of the project cost, subject to a ceiling of Rs.15,000/- per entrepreneur).

The memorandum gives locations identified under the new Industrial Policy for the States of Uttarakhand and Himachal Pradesh in Annexure 1. It gives existing identified industrial locations, where infrastructure has been developed through Government/Government owned Corporations/Boards in Himachal Pradesh. These are Bilaspur Sadar, Hamirpur, Nadaun, Perri, Baldwara, Nahan, Dulehar, Kangra, Jawali, Nagrota Bagwan and Dehra. These are as per Enclosure 1 of the memorandum, which gives the names of the industrial areas/Estates district wise.

Commercial Estates on private land/leased land throughout the State includeIndora, Gagal, Dharamshala, Gangath, Tapri in Kangra district; Tapri, Nichar in Kinnaur district; Bhunter, Ujhi, Kullu in Kullu district; Aut, Dehar, Bagshar in Mandi district; Darlaghat, Kasauli, Dharampur in Solan district; Paonta Sahib, Rajgarh in Sirmaur district; Gagret in Una district; Rawla Kwar, Sarahan, Sunni in Shimla district; and Salooni in Chamba district.

New Locations include Bahadurgarh, Ghumarwin, Kuthera, Balseena in Bilaspur district; Panjala, Banikhet, Chowari, Sihunta in Chamba district; Bijri, Nalti, Taal, Sujanpur-I, Bamson in Hamirpur district; Raja Ka Talab, Palampur in Kangra district; Moorang in Kinnaur district; Banjar, Sainj in Kullu district; Dhellu, Sundernagar, Chauntra, Gopalpur, Nachan, Tungal, Darang Sira in Mandi district; Theog, Jutogh, Rohru in Shimla district; Majra, Kamrao in Sirmaur district; Changar, Solan, Kandaghat, Arki, Patta in Solan district; and Daulatpur, Ishpur, Una , Chururu in Una district.

There are 18 thrust industries for Himachal Pradesh, namely, 1. Floriculture; 2. Medicinal and Aromatic herbs etc. processing; 3. Honey; 4. Horticulture and Agro based industries, such as a) sauces, ketchup etc., b) fruit juices and fruit pulp, c) jams, jellies, vegetable juices, puree, pickles, etc., d) preserved fruits and vegetables, e) processing of fresh fruits and vegetables including packaging f) processing, preservation and packaging of mushrooms; 5. Food Processing Industry excluding those included in the negative list; 6. Sugar and its by-products; 7. Silk and silk products; 8. Wool and

wool products; 9. Woven fabrics (Excisable garments); 10. Sports goods and articles and equipment for general physical exercise and equipment for adventure sports/activities, Tourism (to be separately specified); 11. Paper and paper products excluding those in negative list (as per excise classification); 12. Pharma products; 13. Information and Communication Technology Industry, Computer hardware, Call centres; 14. Bottling of mineral water; 15. Eco-tourism (Hotels, resorts, spa, entertainment/amusement parks and ropeways); 16. Industrial gases (based on atmospheric fraction); 17. Handicrafts; and 18. Non-timber forest product based industries.

Annexure – III of the memorandum categorises 20 activities in the negative list for Himachal Pradesh. These activities are**:** 1. Tobacco and tobacco products including cigarettes and *pan masala*; 2. Thermal power plant (coal/oil based); 3. Coal washeries/dry coal processing; 4. Inorganic Chemicals excluding medicinal grade oxygen (2804.11), Medicinal grade hydrogen peroxide (2847.11), Compressed air (2851.30); 5. Organic chemicals excluding Pro-vitamins/vitamins, Hormones (29.36), Glycosides (29.39); Sugars (29.40) (Reproduction by synthesis not allowed as also downstream industries for sugar); 6. Tanning and dyeing extracts; Tannins and their derivatives, Dyes, colours, paints and varnishes, Putty, fillers and other mastics, Inks; 7. Marble and mineral substances not classified elsewhere; 8. Flour mills/rice mill; 9. Foundries using coal; 10. Minerals fuels, Mineral oils and products of their distillation, bituminous substances, mineral waxes; 11. Synthetic rubber products; 12. Cement clinkers and asbestos, raw including fibre; 13. Explosive (including industrial explosives, detonators and fuses, fireworks, matches, propellant powders etc.); 14. Mineral or chemical fertilisers; 15. Insecticides, fungicides, herbicides and pesticides (basic manufacture and formulation); 16. Fibre glass and articles thereof; 17. Manufacture of pulp, wood pulp, mechanical or chemical (including dissolving pulp); 18. Branded aerated water/soft drinks (non-fruit based); 19. Paper (writing or printing paper etc., paper or paperboard etc., Maplitho paper etc., newsprint, in rolls or sheets, craft paper etc., sanitary towels etc. cigarette paper, grease-proof paper. Toilet or facial tissue etc., paper and paper board, laminated internally with bitumen, tar or asphalt, carbon or similar copying paper, products consisting of sheets of paper or paperboard, impregnated, coated or covered with plastics etc. paper and paperboard, coated impregnated or covered with wax, etc.) and 20. Plastics and articles thereof.

Land Bank: The Department of Industries has identified land in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts of the State and has constituted a Land Bank comprising private land totalling **5089-09 *bighas*** and Government land totalling **1771-17 *bighas*,** which are available for setting up Industries. The private land comprises of such lands whose owners have consented to sell their land to private entrepreneurs through mutual negotiation. The Department of Industries, Government of Himachal Pradesh, will provide escort and facilitation services in case the entrepreneurs are willing to purchase such private land.

In January 2010, the Central Pollution Control Board (CPCB), in association with Indian Institute of Technology (IIT), New Delhi, carried out an environmental assessment of industrial clusters across the country based on Comprehensive Environmental Pollution Index (CEPI) with the aim of identifying polluted industrial clusters and prioritising planning needs for intervention to improve the quality of environment in these industrial clusters and the nation as a whole. The assessment so carried out has been documented in the form of a report entitled 'Comprehensive Environmental Assessment' of Industrial Clusters. In all, 99 industrial cluster have been assessed. The report has concluded that the industrial clusters/areas having aggregated CEPI scores of 70 and above should be considered as critically polluted; and the clusters/areas having CEPI scores between 60-70 should be considered as

severely polluted areas. Baddi, Kala Amb and Parwanoo in Himachal Pradesh, fall under this category and shall be kept under surveillance and pollution control measures should be efficiently implemented; and the critically polluted industrial clusters/areas need further detailed investigations in terms of the extent of damage and formulation of appropriate remedial action plan. The developmental projects from industrial clusters with CEPI score between 60-70 (as listed at serial no. 44 to 75 of the Annexure), which are in the pipeline or are received for grant of environmental clearance in terms of the provisions of EIA Notification, 2006 [including projects for stage-I clearance, i.e., scoping (TORs)], will be considered following the procedure outlined in MoEF's earlier circular no.]-11013/18/2009-IA.II (I) dated 25th August, 2009 relating to 'proposals for environment clearance' for the projects located in the critically polluted areas as identified by the 'Central Pollution Control Board'.

2.7 Energy

The policies and laws applicable and/or related to energy/hydropower sector of the State of Himachal Pradesh are listed below along with a brief description of their relevance. Detailed explanations can be acquired from the websites of relevant Departments and Ministries, such as Ministry of Environment and Forests (MoEF) (www.envfor.nic.in), Mini stry of Power (MoP) (www.power.min.nic.in), Ministry of New and Renewable Energy (MNRE) (www.mnre.gov.in), and Government of Himachal Pradesh (www.himachal.nic.in).

National Level Policies/ Regulations

National Hydropower Policy, 2008: The Government has accorded a high priority to the development of the hydropower potential and has, from time to time, taken a number of policy initiatives to address the issues impeding its development. This hydropower policy is one such initiative, which seeks to induce substantial private investments in hydropower development. The Government of India has set the following broad policy objectives for accelerating the pace of hydropower development.

Inducing Private Investment in Hydropower Development: Lately, there has been tremendous enthusiasm among private developers in taking up sites for the development of hydropower projects. Several States have allocated sites to private developers on Build Own, Operate and Transfer basis (BOOT) basis. Recognising the inherent advantages of inflation free generation coupled with the spiralling prices of fossil fuels, both project developers and financial institutions have shown a renewed interest in investing in hydropower projects. A greater private investment through IPPs and joint ventures is expected to be forthcoming in the years to come and, therefore, a conducive atmosphere needs to be created to maintain this momentum in attracting Private Sector investments in this sector.

Harnessing the Balance Hydro-Electric Potential: The Government has initiated advance preparatory actions for new hydropower projects envisaged to fructify in the 12th Plan period and beyond. Towards this end, preparation of adequate Detailed Project Reports (DPRs) and measures for obtaining the basic statutory clearances etc. have been initiated for the 12th Plan projects. For projects further down the pipeline, emphasis is being laid on measures, such as identification of new green field sites, survey and investigations and preparation of Pre-Feasibility Reports (PFRs).

Improving Resettlement and Rehabilitation: While it is widely recognised that issues relating to resettlement and rehabilitation have been a major impediment in the development of hydropower projects, it has also to be recognised that offering an effective Resettlement & Rehabilitation package aimed at improving people's lives will ensure greater acceptability of such projects, and that resettlement and rehabilitation have to go

beyond mere compensation for loss of assets and livelihood. An effective R&R Policy has to aim at providing a higher living standard to the Project Affected People by making them stakeholders in the project, which would be immensely beneficial for the early commissioning of the project. It has also been felt that there is a need for infusion of a regular stream of revenue aimed at providing income generation and welfare schemes and at creating additional infrastructure and common facilities on a sustained and continued basis.

Facilitating Financial Viability: Keeping in view the difficulties of the hydropower projects in responding to tariff based bidding, the need to develop the requisite transmission lines and also to capture the cost of generation in the most efficient manner for the benefit of all the stakeholders, it is necessary to regulate the tariff from hydropower stations. At the same time, from the point of view of the Private Sector, the major incentive is the scope for trading, particularly, in the later years when cost of generation goes down and the market price of power is high. There is a need to balance these competing interests by ensuring that a major portion of the power is tied up through long term Power Purchase Agreements (PPAs) to facilitate financial closure of hydropower projects, while at the same time providing enough incentives to the developer to invest in this sector. This incentive can be by way of merchant sale, linked to the speedy commissioning of the project. Further, the long term PPAs signed between the developer and the buyers of power would facilitate timely and optimal development of transmission lines and also quick financial closure. Merchant sales in large quantities, on the other hand, would face constraints in transmission capacity, as they utilise the redundancies in the transmission network. In order to avoid a mismatch between construction of hydel projects and availability of transmission lines, binding indemnification agreements need to be signed between the transmission utility and the private developer.

National Electricity Policy, 2005: National Electricity Policy states that the development of 50,000 MW hydropower potential should be carried out speedily. This will also activate economic development of states including Himachal Pradesh. It states that while developing hydropower, adequate safeguards for environmental protection with sustainable monitoring of the implementation of Environmental Action Plan and R&R schemes will be put in place. It further states that proper implementation of National policy on Rehabilitation and Resettlement (R&R) would be essential in this regard so as to ensure that the concerns of project affected families are addressed adequately.

The National Water Policy, 2002: This National level policy addresses several water issues including prioritisation, allocation, pricing and inter-state issues related to water sharing. The National Water Policy states about the use of water, water conservation and quantification of water pollution. The Policy prioritises drinking water as the first priority in all water resources development project.

Section 1.2 of the said Policy states that rivers and underground aquifers often cut across state boundaries. Water as a resource is one and indivisible. Therefore, rainfall, river waters, surface ponds and lakes and groundwater are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of project implementation.

Section 14.5 states that necessary legislation is to be made for preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying

research efforts in various areas, including hydrometeorology; snow and lake hydrology; surface and groundwater hydrology; assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; soil and material research; economical designs for water resource projects, sedimentation of reservoirs, prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact; and regional equity.

The National level Policy addresses several water issues including prioritisation, allocation, pricing and interstate issues related to water sharing. The Policy states about the consumptive use of water, water conservation and quantification of water pollution. It states that water allocation priority should broadly be in the order of drinking water, irrigation, hydropower, ecology, agro industries and non-agriculture industries, navigation and other uses.

National Rehabilitation and Resettlement Policy (NRRP), 2007: NRRP applies to all projects where involuntary displacement takes place, may also apply to Affected Persons displaced persons due to any reason; it recognises directly and also indirectly Affected Persons (APs) and admits the plight of non-title APs. The NRRP is applied on a new project or expansion of an existing project, which involves involuntary displacement of 400 or more families en masse in the plains or 200 or more families en masse in tribal or hilly areas, DDP blocks or areas mentioned in the Schedule V and Schedule VI of the Constitution of India. NRRP-2007 provides the basic minimum requirements for R&R. The State Government, Public Sector undertakings or agencies, and other requiring bodies may place greater benefit levels for Rehabilitation & Resettlement.

National Action Plan on Climate Change (NAPCC), 2008: The National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

National Water Mission is part of NAPCC and identifies the strategies and methodologies in respect of (a) Assessment of Climate Change Impact; (b) Changes in Policy, Practices and Institutional Framework; (c) Measures for Mitigation; as well as (d) Measures for Adaptations. Appropriate monitoring and evaluation mechanism have also been proposed.

A National Water Mission will be mounted to ensure integrated water resource management helping to conserve water, minimise wastage and ensure more equitable distribution both across and within States. The Mission will take into account the provisions of the National Water Policy and develop a framework to optimise water use by increasing water use efficiency by 20 percent through regulatory mechanisms with differential entitlements and pricing. It will seek to ensure that considerable share of the water needs of urban areas are met through recycling of waste water, and ensuring that the water requirements of coastal cities with inadequate alternative sources of water are met through adoption of new and appropriate technologies, such as low temperature desalination technologies that allow for the use of ocean water. The National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. This will include enhanced storage both above and

below ground, rainwater harvesting, coupled with equitable and efficient management structures. The mission will seek to develop new regulatory structures, combined with appropriate entitlements and pricing. It will seek to optimise the efficiency of existing irrigation systems, including rehabilitation of systems that have been run down and also expand irrigation, where feasible, with a special effort to increase storage capacity. Incentive structures will be designed to promote water neutral of water positive technologies, recharging of underground water sources and adoption of large scale irrigation programmes, which rely on sprinklers, drip irrigation and ridge and furrow irrigation.

A National Solar Mission will be launched to significantly increase the share of solar energy in the total energy mix, while recognising the need to expand the scope of other renewable and non-fossil options, such as nuclear energy, wind energy and biomass. With the current efficiency levels, one percent of land area is sufficient to meet electricity needs of India till 2031. It permits decentralised distribution of energy, thereby empowering people at grassroots level. There is a need to enable creation of more affordable and more convenient solar power systems and enable storage of solar power for sustained, long-term use.

The National Mission for Enhanced Energy Efficiency includes four new initiatives proposed to enhance energy efficiency, which are: Enhancing cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities through certification of energy savings that could be traded; accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make them affordable; creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings; and developing fiscal instruments to promote energy efficiency.

Notification on Protection and Improvement of Quality of Environment in the Himalayas, 2001: This notification was issued by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986, specifically for environmental protection in the Himalayan States. The activities relate to location planning in urban areas, Rain Water Harvesting and guidelines for the construction of hill roads.

National Policy on Resettlement & Rehabilitation, 2007: The provision of the National Resettlement & Rehabiliation Policy, 2007 provides for the basic minimum requirements, and all projects leading to involuntary displacement of people must address the Resettlement & Rehabilitation issues comprehensively. The State Governments, Public Sector Undertakings or other agencies shall be at liberty to put in place greater benefit levels than those prescribed in the NRRP-2007.

The Policy addresses the need to provide succour to the asset-less rural poor, support the rehabilitation efforts of the resource poor sections, namely small and marginal farmers, SCs/STs and women, who have been displaced. Besides, it seeks to provide a broad canvas for an effective dialogue between the Project Affected Families (PAFs) and the Administration for R&R to enable timely completion of the project with a sense of definiteness as regards costs and adequate attention to the needs of the displaced persons. The objectives of the Policy are to: minimise displacement, plan the Resettlement & Rehabilitation of Project Affected Families including special needs of Tribals and vulnerable sections, to provide better standard of living to Project Affected Families and to facilitate harmonious relationship between the Requiring Body and Project Affected Families through mutual cooperation.

Tariff Resolution 31st March-2008: In this Ministry's Resolution F. No. 23/2/2005-R&R (Vol.III) dated 6th January, 2006 published in the Gazette of India (Extraordinary), Part I,

Section 1, notifying the Tariff Policy under the provisions of Section 3 of the Electricity Act, 2003, the following amendment is hereby made: The following provision is added at the end of Para 5.1 of the Tariff policy:

"Provided that a developer of a hydroelectric project, not being a State controlled/owned company, would have the option of getting the tariff determined by the appropriate commission on the basis of performance based cost of service regulations if the following conditions are fulfilled:

a. The appropriate Commission is satisfied that the project site has been allotted to the developer by the concerned State Government after following a transparent two stage process. The first stage should be for pre-qualification on the basis of criteria, such as financial strength as measured by net-worth, past experience of developing infrastructure projects of similar size, past track record of developing projects on time and within estimated costs, turnover and ability to meet performance guarantee etc. In the second stage, bids are to be called on the basis of only one single quantifiable parameter, such as, free power in excess of 13 percent, equity participation offered to the State Government, or upfront payment etc.
b. Projects of more than 100 MW design capacity for which sites have been awarded earlier by following a transparent process and on the basis of predetermined set of criteria, would also be covered in this dispensation.
c. Concurrence of Central Electricity Authority (CEA) (if required under Section 8 of the Act), financial closure, award of work and long term Power Purchase Agreement (PPA) (of more than 35 Years) of the capacity specified in (d) below with distribution licencees are completed by 31.12.2010.
d. Long term Product Purchase Agreement would be at least for 60 percent of the total saleable design energy. However, this figure of 60 percent would get enhanced by five percent for delay of every six months in commissioning of the last unit of the project against the scheduled date approved by the appropriate Commission before commencement of the construction. The time period for commissioning of all the units of the project shall be four years from the date of approval of the commissioning schedule by the appropriate Commission. However, the appropriate Commission may, after recording reasons in writing, fix longer time period for large storage projects and run-off-the river projects of more than 500 MW capacity. Adherence to the agreed timelines to achieve the fixed commissioning schedule shall be verified through independent third party verification.
e. Award of contracts for supply of equipment and construction of the project, either through a turnkey or through well defined packages, are done on the basis of international competitive bidding.

In cases, where the conditions mentioned above at (a) to (e) are fulfilled, the appropriate Commission shall determine tariff ensuring the following:

i. Any expenditure incurred or committed to be incurred by the project developer for getting project site allotted (except free power up to 13 percent) would neither be included in the project cost, nor any such expenditure shall be passed through tariff.
ii. The project cost shall include the cost of the approved R&R plan of the project, which shall be in conformity with the following:

- The National Rehabilitation and Resettlement Policy currently in force;
- The Resettlement & Rehabilitation package as enclosed at appendix; and the cost of project developers' 10

percent contribution towards RGGVY project in the affected area as per the project report sanctioned by the Ministry of Power.

iii. Annual fixed charges shall be taken at pro-rate to the saleable design energy tied up on the basis of long term PPAs with respect to total saleable design energy. The total saleable design energy shall be arrived at by deducting the following from the design energy at the bus bar:

- 13 percent of free power (12 percent for the host Government and one percent for contribution towards Local Area Development Fund as constituted by the State Government). This 12 percent free power may be suitably staggered as decided by the State Government
- Energy corresponding to 100 units of electricity to be provided free of cost every month to every Project Affected Family notified by the State Government to be offered through the concerned distribution licencee in the designated resettlement area/project area for a period of ten years from the date of commissioning.

National Clean Development Mechanism Authority Guidelines: The Project Proponents should commit a certain percentage of the Certified Emission Reductions revenue every year, subject to a minimum of two percent for Sustainable Development including society/community development and accordingly make monitorable action plan for the same and include it in the PCN & PD.

National Conservation Strategy and Policy Statement on Environment and Development, 1992: The National Conservation Strategy and Policy Statement on Environment and Development are in response to the need for laying down the guidelines to leave environmental considerations into the fabric of national life and of development process. It is an expression of commitment for reorienting policies and action in unison with the environmental perspective.

Wetlands are referred to notably in Section 2.7 of the statement, "Our unique wetlands, rich in aquatic and bird life, providing food and shelter as also breeding and spawning ground for the marine and fresh water fishes, are facing problems of pollution and over-exploitation."

Section 3.4 on Conservation of Forests and Wildlife refers to "Management Plans for identified wetlands, mangrove areas and coral reefs."

Section 4.0 on constraints and agenda for action states about action. The agenda for action in this regard will include the following to conserve and nurture the biological diversity, gene pool and other resources through environmentally sustainable development and management of ecosystems, with special emphasis on our mountain, marine and coastal, desert, wetlands, riverine and island ecosystems.

Section 5.2 on Conservation of Natural Resources describes conservation of wetlands for ensuring sustainable ecological and economic benefits.

Subsection 5.2.3 mentions about conservation of biodiversity through a network of protected areas including Biosphere Reserves, Marine Reserves, National Parks, Sanctuaries, Gene Conservation Centres, Wetlands, Coral Reefs and such other natural habitats of biodiversity. This should include taxonomic and ecological studies on the flora and fauna with adequate emphasis placed on the lower vertebrate, invertebrate and micro-flora, which are important for contributing to the healthy maintenance of ecosystems

National Electricity Act, 2003: Electricity Act, 2003 provides an enabling framework for accelerated and more efficient development of the power sector, which in turn results in availability of quality supply of electricity to

consumers at competitive rates. The salient features of this policy are: access to electricity - available for all households in next five years; availability of power - demand to be fully met by 2012; energy and peaking shortages to be overcome and adequate spinning reserve to be available; supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates; per capita availability of electricity to be increased to over 1000 units by 2012; minimum lifeline consumption of one unit/household/day as a merit good by year 2012; financial turnaround and commercial viability of electricity sector; protection of consumers' interests. This act mandates concurrence of hydropower projects (R&R) from Central Electricity Authority.

Although power generation has been delicenced, concurrence of Central Electricity Authority is still required under Section 8 (1) of the Electricity Act for setting up of a hydropower generation station estimated to involve a capital expenditure exceeding such as may be notified by the Central Government from time to time.

This Act further states that the Ministry of Water Resources (MoWR)/Central Water Commission (CWC) examine the aspects related to: hydraulic structures for hydropower, water management, flood control, dam safety, regulation and development of inter-State rivers and river basins; Water laws legislation, international water laws and the matter regarding rivers common to India and neighbouring countries; Joint River Commission for Bangladesh and India; Indus Water Treaty and Indus Commission. Accordingly, Detail Project Report of hydro electric projects are sent to Central Water Commission (CWC) for examination on above aspects. Geological aspects of hydroelectric projects are examined by Geological Survey of India.

The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988): This is an Act to provide for the prevention and control of water pollution and maintaining or restoring the wholesomeness of water; for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution; for conferring on and assigning to such Boards powers and functions relating thereto; and for matters connected therewith.

Environment (Protection) Act, 1986: It is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991, has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve environment, which includes water, air and land and the inter relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment Protection Act are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Environment Impact Assessment (EIA) Notification, September 14, 2006: EIA notification makes Environment Impact Assessment study mandatory for only those water sector development project having more than 10000 hectares of command area and power production of more than 25 MW.

Forest (Conservation) Act, 1980 (Amended in 1988): These are Rules and Guidelines as

amended from time to time. Forest clearance is required in case the hydropower project involves land categorised under forest land.

Energy Conservation Act, 2001: According to this Act, usage of energy should be kept at the minimum both at the point of generation as well as at the point of application. These include short term as well as long term measures. The short term measures include: energy conservation, energy audit of Government buildings and capacity building amongst Departments to take up energy efficiency programmes. The long term measures include: industry specific task forces, notifying more industries as designated consumers, conduct of energy audit amongst notified designated consumers, recording and publication of best practices (sector wise), development of energy consumption norms and monitoring of compliance with mandated provision by designated consumers.

The Water (Prevention and Control of Pollution) Act, 1974 (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on the use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act on Prevention and Control of Water Pollution deals with the power of the State Government to restrict the application of the Act to certain areas; power to obtain information; power to take sample of effluents and procedure to be followed; seek reports of the result of analysis on samples taken under Section 21; power of entry and inspection; prohibition on use of stream or well for disposal of polluting matter etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by State Pollution Control Board; appeals; revision; power of State Board to carry out certain works; furnishing information to State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Land Acquisition Act, 1894: Land requirements for hydropower activities and all their associated facilities can be significant. Land acquisition is being done under the Land Acquisition Act, 1894, amended in 1984. Historically, land for hydro-electric power plant has been acquired by the State/Private Sector. The Land Acquisition (LA) Act is currently being modified to link it with the Resettlement and Rehabilitation (R&R) policy. The draft version of the Act seeks to make Resettlement and Rehabilitation enforceable and includes livelihoods, habitats, cultural and natural resources as critical areas of impact to be compensated and addressed, and

modification of the clause of 'public purpose' for acquisition. It also provides for valuing land at replacement value and not at market value as is the status today. Under Land Acquisition, rate should be negotiated and settled mutually, leading to transfer of land.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal solid wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air. 'Transportation' means conveyance of Municipal Solid Wastes from place to place hygienically through specially designed transport systems, so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of Municipal Solid Wastes.

Indian Forests Act, 1927: The Indian Forest Act, 1927 is a legislation, which was enacted mainly to enable the State to govern and manage the forests and their produce and to facilitate and regulate timber trade. It's an Act to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce. The Act encourages conservation of forest biodiversity only by way of controlling and restricting the uses to which the forests can be put, and by restricting access of people to certain categories of forest.

Biological Diversity Act, 2002 and Biodiversity Rules, 2004: This Act primarily aims at giving effect to the provisions of the Convention on Biological Diversity (CBD), including regulating access to biological resources and associated traditional knowledge, so as to ensure equitable sharing of benefits arising out of their use, in accordance with the provisions of Article 15 of the CBD. Biological Diversity Rules were notified in 2004.

Wildlife protection has been included in Article 51-A as a fundamental duty of citizens of the country. In pursuance of this constitutional directive, in 1983, the Government of India, through the National Wildlife Action Plan of the Ministry of Environment, laid down several sets of actions by which wildlife should be conserved. These are contained in the Prime Minister's statement to the Indian Board of Wildlife in 1982, which listed aims of wildlife conservation as: There should be a network of protected areas to cover representative samples of all major wildlife ecosystem and with adequate geographic distribution; degraded habitats in these protected areas should be restored to their national state; rehabilitation of endangered species including restoration to former habitat and pastures; development of adequate corridors for genetic continuity in production forests and pastures; and development of appropriate management system, protected areas, long term conservation of wildlife based on the scientific principles of evolution of genetics.

In 1988, the Government introduced a new Forest Policy, which contains a number of statements on wildlife and on bio-diversity for conserving the natural heritage of the country. The policy states that biodiversity conservation needs to be done by preserving the remaining natural forests with the vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.

The Policy states that for the conservation of total biological diversity, the network of national parks, sanctuaries, bio-sphere, reserves and other protected areas should be protected and strengthened adequately.

Wildlife (Protection) Act, 1972: The Government of India enacted the Wildlife (Protection) Act, 1972 with the objective of effectively protecting the wildlife and to control poaching, smuggling and illegal trade in wildlife and its derivatives. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent. The

Ministry of Environment and Forests has proposed further amendments in the law by introducing more rigid measures to strengthen the Act. The objective is to provide protection to the listed endangered flora and fauna and ecologically important protected areas.

The Act established schedules of protected plant and animal species; hunting or harvesting these species was largely outlawed. It has six schedules, which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection and offences under these are prescribed the highest penalties. Species listed in Schedule IV are also protected, but the penalties are much lower. Enforcement authorities have the power to compound offences under this Schedule (i.e., they impose fines on the offenders). Penalties are prescribed in Section 51. Enforcement can be performed by agencies, such as the Forest Department, the Police, the Customs and the Central Bureau of Investigation (CBI). Charge sheets can be filed directly by the Forest Department.

Amendment in the Wildlife Protection Act was done in 1993 and 2002. Various Rules under this Act include (1) Recognition of Zoo Rules, 2009; (2) S.O.1092(E), [22/9/2003] - The National Board for Wildlife Rules, 2003; (3) S.O.445(E), [18/4/2003] - The Declaration of Wildlife Stock Rules, 2003; (4) G.S.R.350(E), [18/4/1995] - The Wildlife (Specified Plant Stock Declaration) Central Rules, 1995; (5) G.S.R.349(E), [18/4/1995] - The Wildlife (Specified Plants - Conditions for Possession by Licencee) Rules, 1995; (6) G.S.R.348(E), [18/4/1995] - The Wildlife (Protection) Rules, 1995; (7) Recognition of Zoo Rules, 1992; (8) G.S.R.328(E), [13/4/1983] - The Wildlife (Protection) Licensing (Additional Matters for Consideration) Rules, 1983; (9) G.S.R.29(E), [25/1/1973] - The Wildlife (Stock Declaration) Central Rules, 1973; and (10) G.S.R.198(E), [9/4/1973] - The Wildlife (Transaction and Taxidermy) Rules, 1973.

Wetlands (Conservation and Management) Rules, 2010

Ministry of Environment and Forests notified rules for conservation and management of wetlands, namely, Wetl ands (Conservation and Management) Rules, 2010. The rules set regulatory framework for the conservation of wetlands and enlist some of the activities, which are prohibited and others, which need to be regulated. Categorisation of wetlands has also been proposed on the basis of significance of the functions performed and for determining the extent and level of regulation. The Rules have been framed for protected wetlands, set restrictions on activities within wetlands and have made provisions for setting up the Central Wetlands Management Authority. The Rules define the process of identification of wetlands under different categories. The rules have also identified overlapping provisions, and enforcement of regulated activities. There is a great anomaly that the wetlands at the Centre are part of the Ministry of Environment and Forests, while in Himachal Pradesh, they are being managed by the Department of Environment, Science and Technology. State Council for Science Technology & Environment, Himachal Pradesh is the nodal agency of the Government of Himachal Pradesh for conservation and management of wetlands in the state of Himachal Pradesh. This needs to be addressed, so that the biodiversity of wetlands is conserved by the Himachal Pradesh Forest Department also.

State Level Policies

Hydro Power Policy, 2006: The Policy states that Himachal Pradesh being a 'Hydropower State' of the country provides affordable, reliable and quality power to the consumers throughout the year to create avenues for employment to the residents of Himachal Pradesh in the power projects and mitigate the social, economic and environmental impact.

This Policy has made it mandatory to release minimum environmental flow of 15 percent water immediately down-stream of the

diversion structures to address issues concerning riparian rights, drinking water, health, aquatic life, wildlife, fisheries, silt and even to honour sensitive religious issues, like cremation and other religious rites etc. performed on the river banks. Further, the Government would create an 'Authority of Hydro-Project Safety, Quality Control and Management of Water Flows and Discharge' in due course.

A minor amendment in Hydropower Policy 2006 - brought in 2007- recommended "the Fisheries Department will charge compensation @ Rs 0.50 *lakh* per kilometre from tail race to the weir of the project. In addition the IPPs will pay Rs 0.50 *lakh* per MW to the Fisheries Department. It will be mandatory to utilise this amount on the same stream/*nallah* or elsewhere and formulate schemes accordingly. However, these provisions shall not be applicable to projects above 5MW."

An affidavit for the disposal of silt and sustenance of aquatic fauna is required from those intending to set up a hydel project in Himachal Pradesh. Application to the Department of Fisheries, Himachal Pradesh is required for the issuance of 'No Objection Certificate' (NOC). An undertaking is taken from the project authorities that the entire silt/muck during pre-construction and post construction phases of the project shall be disposed off far away from the water resources at their cost and in consultation with and to the full satisfaction of the Department of Fisheries, Himachal Pradesh. Further, undertaking is needed from the project authorities to ensure sufficient water supply at the tail end of the river as per notifications of the Government of Himachal Pradesh from time to time for the sustenance of fisheries wealth during the lean period. Moreover, it's binding on the project authorities that if they fail in their commitment, the Department of Fisheries shall be free to charge the compensation for the estimated aquatic losses. The decision of the Secretary (Fisheries), Government of Himachal Pradesh shall be final in such an event.

State Forest Sector Policy and Strategy 2005: The State level policy on forest development deals with provisions of afforestation, wildlife conservation, development of forest communities etc. Combating desertification by undertaking various measures, such as, in-situ soil and water conservation and water harvesting, sand dune stabilisation and promoting combined production systems, namely, agro-forestry, silvi-pastoral, agri-silvi-pastoral and agri-horticultural systems. Provisions have been made for providing support services to farmers for promotion of agro-forestry through system of incentives. It also emphasises on Watershed Management. Further, participatory mechanisms for planning, implementation and monitoring of Catchment Area Treatment (CAT) plans for hydel projects and mine management plans for mining areas will be introduced for industry, mining and hydel projects.

State Water Policy: The said Policy states that water, as a resource, is one and indivisible; rainfall, river waters, surface ponds and lakes and groundwater are all part of one system. In Himachal Pradesh, availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul and Spiti district to around 3200 mm in Dharamshala, district Kangra. However, in spite of heavy rain and snow during the rainy season and winter, the summer months are periods of water scarcity in many areas as the flow in the rivers and *nallahs* is quite low and traditional sources also dry up. Thus, through its Water Policy, the State also has to address the issues of drought management in some areas and flood control in others.

The Policy states about the requirement of clear guidelines with respect to water related projects. Planning and implementation of water related projects has many socio-economic aspects and issues, such as environmental sustainability, resettlement and rehabilitation of

project-affected people and livestock, public health concerns of water impoundment, dam safety etc.

It states that water resources available to the State should be brought within the category of utilisable resources to the maximum possible extent. Groundwater exploitation for domestic use and irrigation will be promoted wherever feasible and improvising of surface water in pondages for usage during lean periods shall be encouraged.

The Policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan, keeping in view the existing agreements/awards for a basin or a sub-basin, so that the best possible combination of options can be selected and sustained."

The Policy recommends watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

The State level Policy deals with the process and quality of drinking water supply and sanitation means in different areas of the State, mostly in rural sectors. The policy links water harvesting practices in households and community. It assigns duties and responsibilities to *Panchayati Raj* Institutions (PRIs) and NGOs for source development and water allocation. It stresses on awareness for development of optimal and efficient use of drinking water. Further, the said Policy emphasises on non-conventional methods for augmenting availability of water, such as artificial recharge of groundwater and traditional water conservation practices, like Rain Water Harvesting, including Roof-top Rain Water Harvesting, and promotes the use of such water through dual plumbing systems in all buildings. Pilot projects will be supported for demonstration effect. Research and development in these areas shall also be supported.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resource and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation; ecology; afforestation/biodiversity/tourism; agro-industries; hydropower; non-agro-based industries; and navigation and other uses.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective

involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act describes framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the following functions: (a) mobilise voluntary labour and contribution in kind and cash for Community Welfare Programmes; (b) identification of beneficiaries for the implementation of development schemes pertaining to the village; (c) rendering assistance in the implementation of development schemes pertaining to the village, such as:

- Approve plans, programmes and budget prepared by the *Gram Panchayat*, for economic development and social justice.
- Authorise, after being satisfied, issuance of utilisation certificate for funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control of all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for their maintenance and repair; (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing other acts likely to pollute the course so set apart.

Chapter IV-A of this Act states special provisions relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat* at the village level; and (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Management of minor water bodies in the scheduled area: Planning and management of minor water bodies in the scheduled areas shall be entrusted to *Gram Panchayats*, *Panchayat Samitis* or the *Zila Parishads*, as the case may be, in such manner as may be prescribed.

Chapter-XII of this Act describes the preparation of development plans and District Planning Committee. Preparation of development plans entails that (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for its respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district, a District Planning Committee to consolidate the plans prepared by the *Zila Parishads, Panchayat Samitis, Gram Panchayats* , and Municipalities in the district and to prepare a draft development plan for the district as a whole.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This Act defines the functions of the Tourist Development Board under Section 8 of

chapter II. Section 17, chapter III of the Act describes the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, chapter III states that the functions of the Council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spot, environmental upgradation etc.; assisting the local body in maintaining sanitation and infrastructure facility at the tourist spots; regulating the construction, expansion, maintenance and operation of all tourism units and allied activities; preparing a Tourism Master Plan for its area and all tourism units and establishment shall conform to the master plan.

Revised Policy on Development of Eco-tourism in Himachal Pradesh, 2005: The mission of this Policy is "to make Himachal Pradesh a leading Eco-tourism destination in the Country by 2010." One of the objectives places emphasis on actively coordinating with Tourism, Fisheries, Handicrafts, Culture, Youth Services & Sports, HMI (Himalayan Mountaineering Institute) and other related Departments to further the cause of eco-tourism.

One of the strategies of the policy states, "It will concentrate its activities within the forest land, existing Wildlife Sanctuaries and Parks." The policy has identified projects and sites in Himachal Pradesh that include: "Specific areas within the State that are endowed with unique qualities will be promoted as 'Hot Spots' for eco-tourism. These may also include the remote cold-arid deserts of Pooh, Lahaul and Spiti with its unique culture; areas in Kullu for nature and outdoor activities with Great Himalayan National Park as the focal point, Tirthan for angling; Pong Dam for bird watching and water sports; and Shimla for trekking and nature trails etc."

Himachal Pradesh Fisheries Act, 1976: Section 3 of the Act mentions about power to make rules for prohibition and licencing of fishing in selected waters. Subsection 3 states that such rules may:

(a.) prohibit or regulate all or any of the following matters: i. the erection and use of fixed engines; ii. the construction, temporary or permanent, of weirs, dams and bunds; and killing of fish by diversion of natural waters; and iii. the dimension and kinds of fishing gears to be used and the mode of using them.

(b.) prohibit fishing except under licence and regulate the granting of such licence, the fees payable therefore and the conditions to be inserted therein;

(c.) prohibit the destruction or attempt to destroy fish by gun, spear, bow and arrow or like instrument or pollution of water by trade effluents;

(d.) prescribe seasons in which the killing or catching or sale of any fish of any prescribed species shall be prohibited;

(e.) prescribe a minimum size or weight below which no fish or any prescribed species shall be caught, killed or sold;

(f.) prohibit fishing in any specified water for specified period;

(g.) require the owner, mortgage with possession or lease of any tank or *jhil* for the stocking of such tanks or *jhils* with any class or classes of fish;

(h.) prescribe the formation of associations or societies and the collection of funds for the uplift of fishermen and promotion of fishing industry;

(i.) regulate the marketing of fish and also purchase and use of fish for preservation or for the manufacture of any fish products;

(j.) regulate the possession of fishing craft and gear within such specified limits as may appear to be necessary; and k. regulate the transport of all fish or of certain species of fish or fish products within specified limits as may appear

to be necessary.

Section 6 Punishment for Destruction of Fish by Explosives: If any person uses any dynamite or other explosive substances in any water with intent thereby to catch or destroy any fish, that may be therein, he shall be punishable with imprisonment for a term, which may extend to three years or with fine, which may extend to five thousand rupees, or with both.

Section 7 stipulates punishment for destruction of fish by poisoning water. If any person puts any poison, bleaching powder, lime or noxious material into any water with intent thereby to catch or destroy any fish, he shall be punishable with imprisonment for a term, which may extend to three years or with fine, which may extend to five thousand rupees, or with both.

Sub Section 7-A stipulates punishment for the possession of dynamite and other explosive substance to be used for killing the fish. If a person is found to be in possession of a dynamite or any other explosive substance for the purpose of killing the fish near or in the vicinity or on the bank of a river, rivulet, *khad*, pond, lake, reservoir, which are inhabited by the fishes, shall, unless he explains satisfactorily that his possession or control over such a dynamite or the explosive substance was for a lawful object, he is punishable with imprisonment for a term which may extend to two years, or with fine which may extend to three thousand rupees, or with both.

Himachal Pradesh Fisheries Rules, 1979 and Himachal Pradesh Fisheries (Fourth Amendment) Rules: Section 3 (1) mentions that the 'General Waters, Trout Waters and Resources' are declared not being private waters to which all or any of the Rules as according to their respective provisions shall apply. These include:

i. Gobind Sagar Reservoir: impoundment formed by Bhakra Dam up to a reservoir level of 1680 feet in Bilaspur, Una and Mandi districts of Himachal Pradesh;

ii. Pong Reservoir: Impoundment formed by Pong Dam up to reservoir level of 1410 feet in Kangra district of Himachal Pradesh;

iii. Pandoh Reservoir: Impoundment formed by Pandoh Dam on River Beas up to reservoir level of 2940 feet in Mandi district;

iv. Chamera Reservoir: Impoundment formed by Chamera Dam up to reservoir level of 763.16 metres in Chamba district of Himachal Pradesh; and

v. Ranjeet Sagar Reservoir: Impoundment formed by Ranjeet Sagar Dam (Thein Dam) in the area falling in Chamba district of Himachal Pradesh.

Part V prohibits fishing by gun, spear, bow arrow or like instruments or pollution of water by trade affluent. Part VI prohibits fishing etc. in prescribed season and or specified waters.

Other Sub-programmes / Strategies

Department of Rural Development implements following watershed and other water supply programmes, which develop the micro watersheds and have bearing on development and conservation of water resources.

Installation of Hydrams: Hydrams are being installed through a Government of India project for Installation of 400 Hydrams under Swarnjayanti Gram Swarojgar Yojana (SGSY) Special Project Component with a total Project Cost of Rs. 1047.20 *lakhs,* which includes subsidy of Rs. 770.48 *lakhs*, Rs. 161.40 *lakhs* as loan component and Rs. 115.32 *lakhs* as beneficiaries share. The subsidy component will be shared by the Central and State Governments on 75:25 sharing basis. Up to December, 2003, 121 sites have been selected and 133 Hydrams have been procured out of which 71 Hydrams have been installed. Rs. 205.99 *lakhs* have been spent on the installation of Hydrams.

National Rural Employment Guarantee Scheme: The National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective w.e.f. 2nd February 2006. The focus of the scheme is on some works in their order of priority: Water conservation and water harvesting works; Drought proofing works (including afforestation and tree plantation); Irrigation canals including micro and minor irrigation works; Provision of irrigation facility, horticulture plantation and land development facilities on land owned by households belonging to the Scheduled Castes and Scheduled Tribes or to Below Poverty Line (BPL) families or to beneficiaries of land reforms or to the beneficiaries under the *Indira Awas Yojana* of the Government of India; Renovation of traditional water bodies including desilting of tanks; Land developments works; Flood control and protection works including drainage in water logged areas; and Rural connectivity to provide all-weather access.

Reforms in Power Sectors: The Government of Himachal Pradesh is committed to reform its power sector with a view to achieve commercial viability and provide reliable and quality power at competitive prices to all consumers in the State. As a first step, an Memorandum of Understanding (MoU) has been signed by the Himachal Pradesh Government with Ministry of Power, Government of India on 31.3.2001 to reform the power sector in the State and to set out reform measures to be implemented by the Government of Himachal Pradesh with the support that Government of India will provide. Under the reform programme as detailed out in the MoU, the major milestones are to: create independent centres under the overall aegis of Himachal Pradesh State Electricity Board for its major wings, i.e., Generation, Transmission and Distribution; endeavour to progressively reduce the surplus manpower; scrutinise outstanding dues of CPSUs as per scheme approved by Government of India; bring current operations on distribution to reach break-even by 31st March, 2005 and achieve positive returns thereafter; develop an effective Distribution Management Information System; undertake energy audit at all levels; implement a programme in the field of demand side management through energy efficient bulbs, tube lights, time of the day metring etc.; maintain grid discipline, comply with Indian Electricity Grid Code and carry out the directions of the Regional Load Dispatch Centre; undertake computerised billing of all urban consumers by 31st March, 2003 and in the entire State complete computerised billing, accounting and audit system by March, 2005; ensure filing of tariff petition before Himachal Pradesh Electricity Regulatory Commission (HPERC) by 30th April, 2001.

The progress on Accelerated Power Development and Reform Programme (APDRP) front had been made effective since 1st April, 2004. MoU have shown the results given in Table 6.

Table 6: APDRP Achievements

Increase in generation capacity	90%
Demand Increase	20%
Reduction in T&D losses	06%
Increase in Tariff	16%
Improvement in Billing & Collection efficiency	15%

Source: APDRP

Besides signing MoU with the Government of India, Himachal Pradesh has also taken some fundamental steps, like constitution of 'State Electricity Regulatory Commission' (SERC), and metring of 11 KV lines and customers.

Solar Thermal Extension Programme: Under this programme, 29,573 Solar Cookers have been provided in the State up to December 2004 to potential beneficiaries; 3265 Solar Water Heating Systems of different capacities with a total capacity of 5,91,400 LPD (litre per day) have been installed/booked in different parts of the State.

The State Government has taken a decision to make the installation of Solar Water Heating

Systems mandatory in all Government buildings/institutions. As per survey of environment report, 29573 solar cookers, 3265 solar water heating systems, 2426 solar photovoltaic street lighting systems and 147441 solar PV domestic lights have been provided to the State.

Solar Photo Voltaic Programme: Though 100% electrification has been achieved in the State, yet there are a number of hamlets and small pockets of houses, which are still un-electrified. Some of these houses are so remotely located that the people living there cannot hope for electrification by conventional means, since it would not be possible to lay transmission/distribution lines for covering these areas, as it would prove to be very expensive. The only alternative for such a multitude of hamlets/pockets of houses is electrification by providing solar photovoltaic systems for decentralisation application. Two villages, Chasak Bhatori and Murch in Pangi, have been electrified by Solar Photovoltaic Systems. Similarly, Bara Bhangal has also been electrified. Domestic Solar Lights have been provided to the villages @ Rs. 500/- per beneficiary household.

Energy Conservation Programme under HIMURJA: In order to conserve energy, HIMURJA has provided energy efficient devices, like Pressure Cookers, Nutan Stoves and Nutan Jyoti to identified IRDP families in the selected IREP blocks. So far, 105823 Pressure Cookers, 11,196 CFL Systems, 26881 Nutan Jyoti and 41,579 Nutan Stoves have been provided to identified families at a subsidised rate. About 1247 improved wheels (*gharats*) with improved efficiency have also been installed / booked in different parts of the State up to December, 2004.

Portable Micro Hydel Generator Sets: The electric energy can also be generated on a small scale by utilising natural falls available in the *nallahs* and rivulets with the help of micro hydel generator sets. Fifteen portable hydel generator sets have been supplied free of cost to HIMURJA by Ministry of New and Renewable Energy (MNRE), Government of India, out of which 12 have been commissioned in remote Pangi Sub-Division of Chamba district and two in Dodra-Kawar. HIMURJA is also rehabilitating 15 KW demonstrations Unit at Sarahan, district Shimla, which was damaged in flash floods during July, 2003.

Private Sector Participation: The policy of privatisation of power projects in India was mooted by the Government of India in October, 1991. However, Himachal Pradesh had already taken the lead with involvement of private companies in the implementation of hydro-electric projects in the State with a view to exploit its vast hydropower potential even earlier, in October, 1990.

The State Government has recently modified the power policy to ensure expeditious exploitation of the remaining hydroelectric potential likely to be offered to Private Sector and has incorporated in its global invitation for bids for implementation of hydro-electric projects, excluding Small Hydropower Plants (SHPs) up to 5 MW. Among others, the main points incorporated are as follows:

- Projects having installed capacity 5 MW to 100 MW will be awarded through Memorandum of Understanding (MoU) route, whereas the projects exceeding 100 MW will be assigned to the Private Sector on International Competitive Bids route.

- The projects for implementation in the Private Sector will be in Build, Own, Operate and Transfer (BOOT) basis.

- Government of Himachal Pradesh reserves the right of equity participation up to 49 percent on selective basis for the projects above 100 MW installed capacity.

- Land, whether private or Government, shall be taken on lease basis at the rates approved by the Government for the agreement period.

- The Government will constitute a Local

Area Development Authority (LADA) for project(s) being implemented in each river valley. The Deputy Commissioners will be Chairman of LADA and representatives of the developers, HPSEB/State Utility, PWD, IPH, Forest, *Pradhan* of the affected *Panchayat*, Chairman *Panchayat Samiti*, Block Development Officer, Land Acquisition Officer and any other concerned Department will be among other members of the LADA. Concerned SDM will be the Member Secretary of LADA. The LADA will be entrusted with, but not limited to, the following activities:

a) Oversee the restoration of facilities adversely affected due to implementation of the project.
b) Oversee the implementation of Rehabilitation and Relief Plan.
c) Oversee the implementation of Catchment's Area Treatment (CAT) Plan and Compensatory Afforestation.
d) Local development activities related to development of Agriculture, Horticulture, Animal Husbandry, IPH, Health and Forest Departments and other social activities. The activities of LADA during execution will be financed by the project itself and for this purpose, the Developer will make a provision of 1.5 percent of total cost in the Detailed Project Report other than the funds required for R&R scheme and CAT plan. The LADA activities should be financed from the 1.5 percent provision proposed in the DPR and not from the power royalty. The State Government will use the free power royalty.

State Government signed 28 Memorandums of Understanding (MoUs) with Independent Power Producers (IPPs) for various hydroelectric projects, totalling 2868 MW between 1991 and 2004 and subsequently signed Implementation Agreements (IAs) in respect of nine hydro-electric projects with the concerned companies. Out of above, 13 MoUs/IAs have been cancelled due to non-fulfillment of stipulated terms and conditions, so as to resort to re-invitation of bids.

MNRE Capital Subsidy Scheme for Setting up of Commercial Small Hydropower (SHP) Projects up to 25 MW Station Capacity In Himachal Pradesh: The Ministry of New and Renewable Energy Sources will now provide capital subsidy through financial institutions. The subsidy is intended for making re-payment of the term loan provided to the developer of the Small Hydropower Plant projects by the financial institution. The capital subsidy will be released after successful commissioning and commencement of commercial generation from the project to financial institution providing loan to set up the Small Hydropower Plant project. The quantum of subsidy will be independent of quantum of term loan and will be limited to the amount indicated in Table 7 given below:

Table 7: Available Subsidies

Up to 100 KW	From 101 KW to 999 KW	From 1 MW up to 25 MW
45% of Project cost limited to Rs. 30,000/- per KW	45% of Project cost limited to Rs. 30.00 *lakhs* + Rs. 21,625/- per KW.	45% of Project cost limited to Rs. 2.25 *crores* + Rs. 37.50 *lakhs* per MW.

Mines Scheme for providing Promotional Incentives to carry out detailed Survey and Investigation (DSI) and Preparation of Detailed Project Report (DPR) for Small Hydropower Plant Sites up to 25 MW potential in Himachal Pradesh. In order to encourage SHP development at the identified potential sites, the following promotional incentives under SHP programme of MNRE will be applicable in the form of grant-in-aid as per the amount given below or actual cost incurred for carrying out Detailed Survey and Investigation (DSI) and Preparation of Detailed Project Reports of SHP projects by the State/developers, whichever is less as given in Table 8.

Table 8: Grant in Aid for SHPs

Up to 1 MW	Above1 MW up to 10 MW	Above 10 MW & up to 25 MW
Rs. 1.75 *lakhs*	Rs. 3.00 *lakhs*	Rs. 5.00 *lakhs*

Eligibility Criteria: The promotional incentives for Detailed Survey and Investigation Report (hereinafter referred to as DSIR) and DPR are applicable to the developers in Government, Public, Private, Co-operative, Non Government, Joint Sector, who are the owners or have been allotted the project site by the State Government for SHP development. The Proposals to carry out DSI will be considered for identified hydel sites where pre-feasibility studies have been completed, and the Pre-Feasibility Report has been enclosed. The proposal for preparation of Detailed Project Report (DPR) will be considered for SHP project sites where detailed survey and investigations have already been completed, and the DSI report has been enclosed. The Hilly areas would mean the areas in the State as mentioned/declared by various State Governments. The above incentives are subject to modifications from time to time.

Ministry of Non-renewable Energy Subsidy for Development/Upgradation of Water Mills: To encourage the development of water mills in the remote and hilly areas to meet the basic needs of villagers, the Ministry will provide subsidy for development of new water mills or up-gradation of existing ones. The subsidy would be applicable to two categories of water mills: (i) water mills with mechanical output only, and (ii) water mills with electrical output (up to maximum of 5 KW) only, or, both mechanical and electrical output (up to maximum of 5 KW). The quantum of subsidy will be extended as per following details given in Table 9.

Table 9: Subsidy for Water Mills

Category of Water Mill	Amount of Subsidy
1. Watermills for - • Mechanical output only	75% of actual project cost or Rs 30,000/- whichever is less
2. Watermills for - • Electrical output only or, • Both mechanical and electrical output	75% of actual project cost or Rs.1,00,000/- whichever is less

Ministry of Non-renewable Energy Remote Village Lighting Programme Background: The Remote Village Electrification Programme of the Ministry was initiated for electrification of those unelectrified remote census villages and remote unelectrified hamlets of electrified census villages through renewable energy sources, where grid connectivity is either not feasible or not cost effective. Around 3330 unelectrified census villages and 830 unelectrified hamlets of electrified villages have so far been provided with basic electricity facilities. System installation work is currently going on in 1670 remote villages and 630 remote hamlets. In Himachal Pradesh, 21 villages were selected for programme implementation. Out of the villages taken up for electrification through renewable energy sources, 296 are being/have been covered through distributed generation technologies of biomass gasification and small hydropower. The remaining 6431 villages are being/have been covered through solar photovoltaic technologies.

***Atal Bijli Bachat Yojna*:** *Atal Bijli Bachat Yojna,* launched by the Government of Himachal Pradesh, aimed at saving power consumption and power bills by domestic consumers, who have been provided with CFL bulbs per family free of cost. The endeavour of Himachal Pradesh Government to promote CFL use at such a massive scale was indeed a herculean task which the State had accomplished successfully, thereby emerging as an example for rest of the States in the country. Although the Union Government had also launched the Bachat Lamp Yojna on 25th February, 2009, which was somewhat different from Atal Bijli Bachat Yojna. It was providing the domestic consumers of the State with four free CFL bulbs per family. The objective of both the schemes was similar, since it aimed at power saving by every consumer. The power thus saved would be of immense value to the States, which are power deficit during summer season.

Benefits to Himachal Pradesh Government from Hydel Schemes: Himachal Pradesh has

hydroelectric power as one of its main sources of energy. The State Government will be benefited in the following manner from the hydel schemes, executed/being executed by Central Public Sector Undertakings (CPSUs) and Independent Power Producers (IPPs).

Power and Financial Benefits: Initially, the schemes executed in the Central Sector, the State was given only a token share of the energy generated from the power schemes located in Himachal Pradesh, as from the hydel schemes under Bhakra Beas Management Board (BBMB), having an installed capacity of about 2675 MW, only 2.12 percent ad hoc share has been given to Himachal Pradesh. Further, from the power projects presently executed or being executed by CPSUs, 12 percent free power is given to the State throughout the agreement period. In addition, H.P. will also get 15 percent of the power generated, which is at the disposal of the Central Government at Bus Bar rate. From the schemes allotted to IPPs, at present, 12 percent free power is given to the State for the first twelve years and 18 percent for the next twenty eight years. After 40 years, the project is to be transferred to the State free of cost. For future hydel schemes, 12 percent of free power is extended up to 12 years and @ 18 percent for a period of next 18 years and thereafter @ 30 percent for the balance agreement period beyond 30 years as royalty to be provided by the project developers. The operation period of these schemes will again be forty years and at the end of which, these schemes will stand transferred to Himachal Pradesh Government free of cost.

Rajiv Gandhi Grameen Vidyutikaran Yojna - Scheme of Rural Electricity Infrastructure and Household Electrification: This new scheme has been launched by the Ministry of Power, Government of India, to provide access to electricity for all rural households in five years for reaching the goals of the National Common Minimum Programme (NCMP). The approval of the Government of India has already been accorded in March, 2005. The highlights of the programme are: The scheme will be implemented through the Rural Electrification Corporation (REC), which will act as a nodal agency; ninety percent capital subsidy would be provided by the Central Government to cover the overall cost of the project; Below Poverty Line (BPL) households would get electricity connection free of charge; revenue sustainability of electricity supply would be ensured through franchises, which might be NGOs, users' associations, co-operatives or individual entrepreneurs with association of *Panchayati Raj* institutions; no discrimination in the hours of supply between rural and urban households; services of Central Public Sector Undertakings (CPSUs) made available to States willing to utilise their services for implementing the programme; and the scheme will create the necessary infrastructure through:

Rural Electricity Distribution Backbone (REDB): Provision of 33/11 KV (or 66/11 KV) sub-stations of adequate capacity and lines in blocks where these do not exist.

Creation of Village Electrification Infrastructure (VEI): Electrification of unelectrified villages; electrification of unelectrified habitations; provision of distribution transformers with appropriate capacity in electrified villages/habitations.

Decentralised Distributed Generation (DDG) and Supply: System for villages where grid connectivity is either not possible or not cost effective. Under the above scheme, Himachal Pradesh Government, through HPSEB, will provide one transformer for each village in the State for maintaining a reliable and efficient power supply. Also a 33 KV sub-station would be installed in every block in the State. District-wise schemes are already under preparation in HPSEB, to be submitted to Ministry of Power, Government of India, to take and use maximum funds shortly. So far, schemes for seven districts have been submitted to the Centre and for the remaining five districts, schemes are being formulated.

New Renewable Energy Programme: "The Central Government has agreed in principle to develop Shimla and Hamirpur towns as 'Solar

Cities' and the Dr.Y.S. Parmar University of Horticulture and Forestry at Nauni in Solan district and the National Institute of Technology at Hamirpur as 'Energy Parks' under the Ministry of New Renewable Energy's programmes."

National Solar Mission: To expand its green energy options, Himachal Pradesh has cleared State's first solar power project at Verra Dol, near Naina Devi in Bilaspur. The two MW project to be set-up on pilot basis will cost nearly Rs 40 *crores* and will be completed by 2012. The solar project marks the drive of Himachal to tap energy from non-conventional resources, which have so far remained untapped for years, even as the State has huge potential for solar power. The move comes close on the heels of National Solar Mission, which the Prime Minister had launched in 2009 to generate 1,000 MW power by 2013 and another 20,000 MW by 2022. The solar mission also proposes to ease duty on import of related items and fiscal incentives for private players.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria: (a) The project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open competitive bidding, provided that in case of railway projects that are not amenable to operation by a Private Sector company, the Empowered Committee may relax this eligibility criterion; (b) International Convention Centres and other tourism infrastructure projects, provided that the Empowered Committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed 20 percent of the total project cost, provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total project cost. Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability Gap Funding up to Rs. 100 *crores* (Rs. One Hundred *Crore*) for each project may be sanctioned by the Empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *crores* (Rs. Two Hundred *Crores*) may be sanctioned by the Empowered Committee and amounts exceeding Rs. 200 *crores* may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

National Wetlands Conservation Programme: The Government of India has been implementing the National Wetlands Conservation Programme (NWCP) in close collaboration with the State/UT Governments since the year 1985-86. Under the programme, 115 wetlands have been identified by the Ministry, which require urgent conservation and management interventions. Five wetlands in Himachal Pradesh, namely, Renuka, Pong Dam, Chandratal, Rewalsar and Khajjiar have been identified under National Wetlands Conservation Programme (as on June, 2009), MoEF, Government of India for their urgent conservation and management.

The aim of the programme is conservation of wetlands in the country so as to prevent their further degradation and ensuring their wise use for the benefit of local communities and overall conservation of biodiversity.

The programme was initiated with the following objectives: To lay down policy guidelines for conservation and management of wetlands in the country; to provide financial assistance for undertaking intensive

conservation measures in the identified wetlands; to monitor the implementation of the programme; and to prepare an inventory of Indian wetlands.

Since the land resources belong to them, the State Governments/Union Territories Administrations are responsible for the management of wetlands and implementation of the NWCP for ensuring their wise-use.

Under this scheme wetlands, grasslands, special habitats are to be identified and declared nature heritage sites.

Other related Schemes of the MoEF being implemented for conservation of wetlands, which are relevant include: Integrated Development of Wildlife Habitats; Project Tiger; Project Elephant; National Biosphere Reserves Programme and National Afforestation Programme.

The Pong dam wetland is being managed by the Forest Department with a Centrally assisted Intensive Management Plan for the improvement and creation of suitable habitats, and nesting and roosting sites for several species of birds. The Government of Himachal Pradesh has also undertaken the ecological improvement and restoration of Renuka and Riwalsar wetlands for conservation and propagation of their biotic resources.

The Himachal Pradesh Forest Department has undertaken plantation work in the peripheral area of the Pong lake. This has been done for checking the silt as well as providing nesting and roosting places for the birds. The island of Ramsar has been developed for nature conservation education. A rest house has been built on this island and boat facility is provided for the school children to go up to the island for bird watching.

National Lake Conservation Plan (NLCP), 2001: Recognising the importance of lakes, the Ministry of Environment and Forests, Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The scheme was approved by the Government of India during the IX Plan (June 2001) as 100 percent Central Grant. Funding pattern under NLCP has since been changed w.e.f. February, 2002 from 100 percent Central funding to 70:30 cost sharing between the Central and the concerned State Governments.

In order to identify polluted and degraded lakes across the country, a study was carried out by MoEF at the instance of the Planning Commission, Government of India through which 62 lakes were identified across the country for conservation. This list was sent to all State Governments for amendment and finalisation, keeping in view the State priority and the justification for their inclusion in the priority list. The State priority and justification for such a selection needs to be a part of the proposal for consideration under NLCP. In view of the prevailing dynamic situation, States may revise the priority list at an interval of five years, covering different geographic regions of the State.

The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country, degraded due to waste water discharge into the lakes and other unique freshwater ecosystems, through an integrated ecosystem approach. Unique fresh water ecosystems cover lakes that are unique entities of incomparable values and need to be preserved and conserved, e.g., high altitude lakes, Lonar lake Maharashtra etc.

Activities Covered under NLCP: Prevention of pollution from point sources by intercepting, diverting and treating the pollution loads entering the lake. The interception and diversion works may include sewerage and sewage treatment for the entire lake catchment area.

i. In situ measures for lake cleaning, such as de-silting, de-weeding, bioremediation,

aeration, bio-manipulation, nutrient reduction, withdrawal of anoxic hypolimnion, constructed wetland approach or any other successfully tested eco-technologies etc. depending upon the site conditions.

ii. Catchment area treatment, which may include afforestation, storm water drainage, silt traps etc.
iii. Strengthening of bund, lake fencing, shoreline development etc.
iv. Lake front eco-development including public interface.
v. Solid waste management and provision of *dhobi ghats* is generally not covered under NLCP.
vi. Prevention of pollution from non-point sources by providing low cost sanitation.
vii. Public awareness and public participation.
viii. Capacity building, training and research in the area of Lake Conservation.
ix. Any other activity depending upon location specific requirements.

Selection criteria for the lake included hydrological, scientific and administrative criteria.

Hydrological Criteria include: (a.) The lake water body is perennial, i.e., it holds a certain volume of water at all times, even in the lean seasons of the year; (b.) Physical parameters of the lake are: (i) Lake size > 10 hectares (Exception: lakes larger than three hectares having socio cultural or religious importance) (ii) Lake depth (maximum depth) > three metres

Scientific Criteria include: The lake is justifiably prioritised by the concerned State Government or if the water body is highly degraded and cannot be put to its traditional use primarily because of either (a) or (a) & (b) as indicated: (a.) Discharge of domestic and industrial waste water into the lake; (b.) i. Dumping of Municipal Solid Waste, ii. Other non point sources of pollution and iii. Flow of heavy silt loads from the lake catchment.

The lake water body is degraded and not meeting the desired standards. In the absence of specific water quality criteria developed in respect of lakes, for the present, Designated Best Use criteria for surface waters for bathing quality as given by Central Pollution Control Board (CPCB) shall be the target for achieving lake water quality.

Solid waste management, especially, waste minimisation and recycling for resource recovery (waste collection and transportation) and providing *dhobi ghats* (especially in semi-urban areas) generally remains to be a Municipal function not covered under NLCP.

Unplanned land use leading to heavy soil erosion and sediment transport into the lake resulting in nutrient enrichment of lake (Nitrate and Phosphate) signifying eutrophication.

Administrative Criteria include: The lake, if getting degraded/eutrophied, is an important source of drinking water supply, domestic use, recreational use, providing other goods and services, may be proposed under NLCP, when there is a high degree of demand from a public forum/local stakeholders for its conservation and if the forum/stakeholders give their commitment to bear 10 percent out of State share in the project cost.

Subsequent to prioritisation and for consideration of a lake under NLCP, the State Governments need to get perspective plans and proposal (Detailed Project Reports) prepared through consultants or in-house in case the expertise exists, based on surveys including water quality and biodiversity of the lake. The Manual on Sewerage and Sewage Treatment developed by the Central Public Health Environmental Engineering Organisation (CPHEEO), Ministry of Urban Development, Government of India, December, 1993, should be referred for sewerage, sewage treatment and storm water management whereas for water quality and sediment monitoring, the Gazette Notification on Uniform Protocol Water Quality

Monitoring Order (June, 2005) and American Public Health Association (Latest Edition) on Water and Waste water Analysis should be followed for preparing the DPR. The DPRs need to be submitted to the Ministry along with a summary of the proposal as per the format.

National Biodiversity Action Plan, 2008: The National Biodiversity Action Plan (NBAP) is a framework for taking action by the multitude of stakeholders in biodiversity for achieving the three objectives of the Convention on Biological Diversity (CBD), namely, conservation of biodiversity, sustainable use of its components, and fair and equitable sharing of benefits arising out of their use. The NBAP draws upon the main principle in the NEP that human beings are at the centre of concerns of sustainable development and they are entitled to a healthy and productive life in harmony with nature.

Taking cognizance of the existing legislations, implementation mechanisms, strategies, plans and programmes, action points have been designed in the NBAP, so as to integrate biodiversity concerns into various others sectors. NBAP is consistent with the ecological, social, cultural and economic mosaic of the country and provides focus and impetus to the current efforts towards biodiversity conservation.

2.8 Market Infrastructure

The policies and laws applicable and/or related to marketing infrastructure sector of the State along with a brief description of their relevance are listed below. These policies, laws, sub-programmes and strategies provide operating framework for the sector to address issues, causes and impacts. Detailed explanations can be acquired from the websites of relevant Departments and line Ministries like Ministry of Agriculture (www.envfor.nic.in), State Agriculture Marketing Board (SAMB), Department of Horticulture (www.hphorticulture.nic.in), and Department of Agriculture, Himachal Pradesh (http://agriculture.nic.in).

National Level Policies / Regulations

National Agriculture Policy, 2000: The first National Policy on Agriculture was brought out in 2000, which seeks to actualise the vast untapped growth potential of Indian agriculture; strengthen rural infrastructure to support faster agricultural development; promote value addition; accelerate the growth of agro business; create employment in rural areas; secure a fair standard of living for the farmers and agricultural workers and their families; discourage migration to urban areas; and face the challenges arising out of economic liberalisation and globalisation. Over the next two decades, it aims to attain a growth rate in excess of four percent per annum in the agriculture sector; growth that is based on efficient use of resources and conserves soil, water and bio-diversity; growth with equity, i.e., growth, which is widespread across regions and farmers; growth that is demand driven and caters to domestic markets and maximises benefits from exports of agricultural products in the face of the challenges arising from economic liberalisation and globalisation and growth that is sustainable technologically, environmentally and economically sustainable.

The National Horticulture Mission (NHM) was launched in May 2005 as a major initiative to bring about diversification in agriculture and augment income of farmers through cultivation of high value horticultural crops. The National Horticulture Mission (NHM) aims at doubling horticulture production by 2012. India's main Policy focus until recently was only on grains and cereals, which has changed in a timely manner with the launch of the National Horticulture Mission in 2005-06 by the Government of India with a mandate to promote integrated development in horticulture to help in coordinating, stimulating and sustaining the production and

processing of fruits and vegetables and to establish a sound infrastructure in the field of production, processing and marketing with a focus on post harvest management to reduce losses.

National Seed Policy, 2002: It has become evident that in order to achieve food production targets of the future, a major effort will be required to enhance the seed replacement rates of various crops. A major increase in the production of quality seeds is required in which the Private Sector is expected to play a significant role. At the same time, Private and Public Sector Seed Organisations at both Central and State levels are expected to adopt economic pricing policies that would seek to realise the true cost of production. The creation of a facilitative climate for growth of a competitive and localised seed industry, encouragement of import of useful germ-plasm and boosting of exports are the core elements of the agricultural strategy of the new millennium.

National Water Policy, 2002: This National level Policy addresses the water issues including prioritisation, allocation, pricing and inter-state issues related to water sharing. The Policy states about the use of water, water conservation and quantification of water pollution.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, including hydrometeorology; snow and lake hydrology; surface and groundwater hydrology; assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; soils and material research; economical designs for water resource projects, sedimentation of reservoirs, prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact and regional equity.

The National Environment Policy, 2006: The National Environment Policy, 2006 states that the degradation of land in India through soil erosion, alkali-salinisation, water logging, pollution, and reduction in organic matter content has several proximate and underlying causes. The proximate causes include loss of forest and tree cover (leading to erosion by surface water run-off and winds), unsustainable grazing, excessive use of irrigation (in many cases without proper drainage, leading to leaching of sodium and potassium salts), improper use of agricultural chemicals (leading to accumulation of toxic chemicals in the soil), diversion of animal wastes for domestic fuel (leading to reduction in soil nitrogen and organic matter), and disposal of industrial and domestic wastes on productive lands. These proximate causes of land degradation, in turn, are driven by implicit and explicit subsidies for water, power, fertilisers and pesticides.

The Policy prescribes that it is essential for relevant fiscal, tariffs, and sectoral Policies to take explicit account of their unintentional impacts on land degradation, if the fundamental basis of livelihoods for the vast majority of Indian people is not to be irreparably damaged.

In addition to such Policy reviews, the following specific initiatives would be taken: a) Encourage adoption of science-based and traditional, sustainable land use practices through research and development, extension of knowledge, pilot scale demonstrations, and large scale dissemination, including farmer's training, and where necessary, access to institutional finance; b) Promote reclamation of wasteland and degraded forestland through formulation and adoption of Multi-Stakeholder Partnerships, involving the land owning agencies, local communities and investors; c) Prepare and implement thematic action plans, incorporating watershed management strategies, for arresting and reversing desertification, and expanding the green cover;

d) Promote sustainable alternatives to shifting cultivation, where it is no longer ecologically viable, ensuring that the culture and social organisation of the local people are not disrupted; and Encourage agro-forestry, organic farming, environmentally sustainable cropping patterns and adoption of efficient irrigation techniques.

National Policy on Safety, Health and Environment at Work Place, 2010: The major objective of this Policy is continuous reduction in the incidence of work related injuries, fatalities, diseases, disasters and loss of national assets by effectively enforcing all applicable laws and regulations concerning safety, health and environment at work places.

Agriculture Produce Marketing Committee (APMC) Act 2003: The APMC Act, 2003 in each State of India requires all agricultural products to be sold only in agricultural markets. Agriculture markets in most parts of the country are established and regulated under the State APMC Acts. The APMC have been made specifically responsible for ensuring complete transparency in pricing system and transactions taking place in market area; providing market-led extension services to farmers; ensuring payment for agricultural produce sold by farmers on the same day; promoting agricultural processing including activities for value addition in agricultural produce; and publicising data on arrivals and rates of agricultural produce brought into the market area for sale. It is also responsible for setting up and promoting Public Private Partnership in the management of agricultural markets. Besides, a new Chapter on 'Contract Farming' is added to provide for compulsory registration of all contract farming sponsors, recording of contract farming agreements, resolution of disputes, if any, arising out of such agreement, exemption from levy of market fee on produce covered by contract farming agreements and to provide for indemnity to producers' title/possession over his land from any claim arising out of the agreement.

The State Agricultural Produce Marketing (Development and Regulation) Act, 2003: It's an Act to provide for improved regulation in marketing of agricultural produce, development of efficient marketing system, promotion of agri-processing and agricultural export and the establishment and proper administration of markets for agricultural produce in the State and, where it is expedient, to put in place an effective infrastructure for marketing of agricultural produce and lay down procedures and systems.

The Act defines 'Agricultural Produce' as all produce and commodities, whether processed or unprocessed, of agriculture, horticulture, apiculture, sericulture, livestock and products of livestock, fleeces (raw wool) and skins of animals, forest produce etc. as are specified in the schedule or declared by the Government by notification from time to time and also includes a mixture of two or more than two such products. Subsequently, a draft model Rules, namely, the State Agricultural Produce Marketing (Development and Regulation) Rules, 2007 have been framed, which States can adopt.

The Agricultural and Processed Food Products Export Development Authority Act, 1985 No. 2 of 1986: An Act to provide for the establishment of an Authority for the development and promotion of exports of certain agriculture and processed food products and for matters connected therewith. The Gazette of India extraordinary (Part ii-Sec-1) includes schedule for fruits, vegetables and their products and floriculture and floriculture products.

Essential Commodities Act, 1955: The Act provides for regulation and control of production, distribution and pricing of commodities, which are declared as essential for maintaining or increasing supplies or for securing their equitable distribution and availability at fair prices. Using the powers under the Act, various Ministries/Departments of the Central Government have issued Control Orders for regulating

production/distribution/quality aspects/movement, etc. pertaining to the commodities, which are essential and administered by them. Most of the powers under the Act have been delegated to the State Governments. Orders under this Act provide: (a) for bringing under cultivation any waste or arable land, whether appurtenant to a building or not, for the growing thereon of food crops generally or of specified food crops, and for, otherwise, maintaining or increasing the cultivation of food crops generally, or of specified food crops; (b) for regulating by licences, permits or, otherwise, the storage, transport, distribution, disposal, acquisition, use or consumption of any essential commodity.

The items declared as essential commodities under the Essential Commodities Act, 1955 are reviewed from time to time in the light of liberalised economic policies in consultation with the Ministries/Departments administering the essential commodities and, particularly, with regard to their production, demand, and supply. From 15 February 2002, the Government removed 11 classes of commodities in full and one in part from the list of essential commodities declared earlier. In order to accelerate economic growth and to benefit consumers, two more commodities have been deleted from the list from 31 March 2004. At present, the list of essential commodities contains 15 items.

List of commodities declared essential under the Essential Commodities Act, 1955: Declared under Clause (a) of Section 2 of the Act: 1. Cattle fodder, including oilcakes and other concentrates; 2. Coal, including coke and other derivatives; 3. Component parts and accessories of automobiles; 4. Cotton and woollen textiles; 5. Drugs; 6. Foodstuffs, including edible oilseeds and oils; 7. Iron and Steel, including manufactured products of Iron and Steel; 8. Paper, including newsprint, paperboard and strawboard; 9. Petroleum and Petroleum products; 10. Raw cotton either ginned or unginned and cotton seed; 11. Raw jute; 12. Jute textiles; 13. Fertiliser, whether inorganic, organic or mixed; 14. Yarn made wholly from cotton; and 15. (i) Seeds of food crops and seeds of fruits and vegetables, (ii) Seeds of cattle fodder and (iii) Jute seeds.

Agricultural Produce (Grading and Marking) Act, 1937, as Amended up to 1986: It's an Act to regulate grading and marking of agriculture and other produce. This Act came into force since 1975. Item 2 defines 'agricultural produce' as all produce of agriculture or horticulture and all articles of food or drink wholly or partly manufactured from any such produce, and fleeces and the skins of animals. This Act provides guidance in grading and marking in the interest of public health and safety. Its Schedule lists 80 products, namely, 1. Fruits, 2. Vegetables, 3. Eggs, 4. Dairy produce, 5. Tobacco, 6. Coffee, 7. Hides and Skins, 8. Fruit products, 9. Atta, 10. Oilseeds, 11. Vegetable oils (including hydrogenated oils and vegetable fats), 12. Cotton, 13. Rice, 14. Lac, 15. Wheat, 16. Sann Hemp, 17. Sugarcane gur (Jaggery), 18. Myrobalans, 19. Bura, 20. Wool and Goat Hair, 21. Bristles, 22. Rosin and Turpentine, 23. Areca nuts, 24. Essential Oils, 25. Cashew nuts, 26. Cardamom, 27. Pepper, 28. Ginger, 29. Honey, 30. Curry Powder, 31. Kapok, 32. Raw Jute, 33. Paddy, 34. Millet, 35. Mesta, 36. Chillies, 37. Turmeric, 38. Tapioca Chips and Tapioca Flour, 39. Sisal and Aloe Fibres, 40. Oil cakes, 41. Condiments and Spices (Other than pepper, ginger, cashew nut, cardamom, chillies and turmeric, to which the provisions of the Act have already been applied.), 42. Pulses, 43. Walnuts, 44. Animal casings (cattle, buffaloes, sheep, goats and pigs), 45. Guar Gum, 46. Karaya Gum, 47. Senna Leaves and Pods, 48. Palmyra fibre, 49. Catechu, 50. Tendu Leaves, 51. Water Chest-nuts, 52. Mushrooms, 53. Poppy seed, 54. Cashew-Shell Oil (Liquid.), 55. Beeswax, 56. Gram (*Cicer arietinum*), 57. Jowar (*Sorghum vulgare*), 58. Maize (*Zea mays*), 59. Barley (*Hordeum vulgare*), 60. Ragi (*Eleusine coracana*), 61. Bajra (*Pennisetum typhoides*), 62. Sheekakai Powder, 63. Meat chicken and dressed chicken meat, 64. Saffron, 65. Soya bean, 66. Hay, 67. Buffalo hair, 68. Tamarind and tamarind products, 69.

Compounded asafoetida, 70. Besan (flour obtained from de-husked gram), 71. Papain, 72. Coconuts (including copra), 73. Cattle Feeds, 74. Poultry Feeds, 75. Suji and Maida, 76. Agar Agar, 77. Tea, 78. Isubgol husk, 79. Carcass meat and products thereof, and 80. Tapioca Sago.
Subsequently, General Grading and Marking Rules, 1988 were framed. The Act provides powers to inspect and seize agriculture produce and penalise under Sections 93 and 102 of Criminal Penal Code.

The Indian Sale of Goods Act, 1930. A contract of sale of goods is a contract whereby the seller transfers or agrees to transfer the property in goods to the buyer for a price. There may be a contract of sale between one part-owner and another [Section 4(1)]. A contract of sale may be absolute or conditional [Section 4(2)].

Delivery of Goods to Buyer: The Act makes elaborate provisions regarding delivery of goods to buyer. It is the duty of the seller to deliver the goods and of the buyer to accept and pay for them, in accordance with the terms of the contract of sale [Section 31]. Unless otherwise agreed, delivery of the goods and payment of the price are concurrent conditions, that is to say, the seller shall be ready and willing to give possession of the goods to the buyer in exchange for the price, and the buyer shall be ready and willing to pay the price in exchange for possession of the goods[Section32].Notethatthisis'unless otherwise agreed', i.e., buyer and seller can agree to different provisions in respect of payment and delivery.

Acceptance of Goods by Buyer: Contract of sale is completed not by mere delivery of goods, but by acceptance of goods by buyer. 'Acceptance' does not mean mere receipt of goods. It means checking the goods to ascertain whether they are as per contract. Where goods are delivered to the buyer, which he has not previously examined, he is not deemed to have accepted them unless and until he has had a reasonable opportunity of examining them for the purpose of ascertaining whether they are in conformity with the contract [Section 41(1)]. Unless otherwise agreed, when the seller tenders delivery of goods to the buyer, he is bound, on request, to afford the buyer a reasonable opportunity of examining the goods for the purpose of ascertaining whether they are in conformity with the contract [Section 41(2)].

The Packaged Commodities Order, 1975: This order ensures a commodity, which has been pre packed, whether in any bottle, tin, wrapper, or otherwise, in units suitable for sale, whether wholesale or retail, and such pre packing has been so made as to ensure that the commodity in the packaged form cannot be used or consumed without the package or its lid or its cap, as the case may be, being opened.

Standards of Weights and Measures Act, 1976: This Act seeks to establish standards of weights and measures to regulate trade or commerce in weights, measures and other goods, which are sold or distributed by weight, measure or number, to provide for matters connected therewith or incidental thereto. The Central Government may, by rules made on this behalf, specify the base units and also specify in relation to the base units of weight or measure, such supplementary, derived, or other units or standard symbols or definitions as the General Conference on Weights and Measures or the International Organisation of Legal Metrology may recommend.

- Any weight or measure, which conforms to the standard unit of such weight or measure and also conforms to such provisions of Sections 15 to 19 (both inclusive) as are applicable to it, shall be the standard weight or measure.
- No weight, measure or numeral, other than the standard weight, measure or numeral, shall be used as a standard weight, measure or numeral.
- No weight or measure shall be made or manufactured unless it conforms to the standards of weight or measure established by or under this Act:

Provided that the Central Government may permit the making or manufacturing of any weight or measure, which does not conform to the standards established by or under this Act, if such weight or measure is made or manufactured exclusively for the purpose of any scientific investigation or research or for export and is made or manufactured under such conditions and restrictions as may be prescribed.

Consumer Protection Act, 1986: This is an Act to provide for better protection of the interests of consumers and for that purpose to make provision for the establishment of consumer councils and other authorities for the settlement of consumers' disputes and for matters connected therewith.

The object of this Act is to promote and protect the rights of the consumers, such as,—

(a) The right to be protected against the marketing of goods and services, which are hazardous to life and property;

(b) The right to be informed about the quality, quantity, potency, purity, standard and price of goods or services, as the case may be, so as to protect the consumer against unfair trade practices;

(c) The right to be assured, wherever possible, access to a variety of goods and services at competitive prices;

(d) The right to consumer education.

The Trade and Merchandise Marks Act 1958: For the purpose of this Act, there shall be established a Registry, which shall be known as the Trade Marks Registry. The head office of the Trade Marks Registry shall be at such place as the Central Government may specify, and for the purpose of facilitating the registration of trademarks, there may be established at such places as the Central Government may think fit, branch offices of the Trade Marks Registry. The Central Government may, by notification in the Official Gazette, define the territorial limits within which an office of the Trade Marks Registry may exercise its functions. There shall be a seal of the Trade Marks Registry.

Forward Contracts (Regulation) Act, 1952:

The main function of this Act is:

- To keep forward markets under observation and to take such action in relation to them as it may consider necessary, in exercise of the powers assigned to it by or under this Act.
- To collect and whenever the Commission thinks it necessary to publish information regarding the trading conditions in respect of goods to which any of the provisions of this Act is made applicable, including information regarding supply, demand and prices.
- To submit to the Central Government periodical reports on the operation of this Act and on the working of forward markets relating to such goods.
- To make recommendations generally with a view to improving the organisation and working of forward markets.

Destructive Insects and Pests Act, 1914 (Act No. II of 1914): It's an Act to prevent the introduction into India and the transport from one province to another of any insect, fungus or other pest, which is or may be destructive to crops. In this Act, crops include all agricultural or horticultural crops and all trees, bushes or plants and 'import' means the bringing or taking by sea, land or air across any customs frontier as defined by the Central Government.

It empowers the Central Government to prohibit or regulate, subject to such restrictions and conditions as it may impose, the import into India or any part thereof, or any specified place therein, of any article or class of articles likely to cause infection to any crop or of insects generally or any class of insects. A notification under this Section may specify any article or class of articles or any insect or class of insects either generally or in any particular manner, whether with reference to the country of origin or the route by which imported or

otherwise. The Central Government may, by notification under this Section, also levy and collect such fees at such rates and in such manner as may be specified therein for making an application for a permit to import, or for making inspection, fumigation, disinfection, disinfestation or supervision of any article or class of articles or any insect or class of insects under this Section.

Plant Quarantine (Regulation of Import into India) Order, 2003: The Order sets regulation for prohibiting and regulating imports into India of agriculture articles. It has been amended two times in 2004, and subsequently amended in 2005, 2006 and, 2007. Besides, a corrigendum, namely, Plant Quarantine (Regulation of Import into India) Order (Corrigendum), was issued in 2006.

Chapter II & III of this Order cover general and specific conditions for import and issuance of Phytosanitary Certificate. Chapter IV describes post entry quarantine conditions and measures. Schedule IV describes a list of 14 plant species and countries from where import is prohibited along with justifications. Schedule V describes a list of 17 plant species/plant materials restricted for imports and permissible only by authorised institutions. Schedule VI describes 525 plant species and category species of plant material allowed to be imported. Schedule VII describes a list of 81 plants and plant materials, where import is permissible on the basis of Phytosanitary Certificate issued by the exporting country, the inspection conducted by inspection authority and fumigation, if required. Schedule VIII describes a list of 61 quarantine weed species. This order also covers germ-plasm, trans-genic or genetically modified organisms. Further, this covers noxious weeds, pests, plant product, timber and tissue culture plants.

The Insecticides Act, 1968 G.S.R. 576 (E), Dated 26th August, 1993: It's an Act to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, environment and for matters connected therewith. Subsequently, Insecticides Rules were framed in 1971.

Notification dated 25th October, 2005 under the Act mandates withdrawal of the use of Dichloro-Diphenyl-Trichloroethane (DDT) and restricts its use for the public health programme to 10,000 Metric Tonnes per annum, except in case of any major outbreak of epidemic.

Under Sub-section (2) of Section 27 read with Section 28 of the Insecticides Act, 1968, an order dated May 06, 2005 was issued banning the use of Monocrotophos on vegetables. Similarly, the use of Linuron and Iprodione has been banned vide notification dated 31st December 2008.

In respect of those registrants, who do not return the registration certificate, as per this Order within a period of six months with effect from the date of publication of this Order, their licence granted under Section 13 of the said Act shall not be renewed or action under Section 14 of the Act should be taken. The State Governments shall have power to take such steps under the relevant provisions of the said Act and the rules made there under as they may deem fit for the execution of these orders in the State concerned. Under the Insecticide Act, 1968, cancellation of Certificate of Registration Order 2010 has been issued for cancellation of registration to manufacturers of insecticides.

Fruit Protection Act 137 of 1935: This Act provides for the protection of the public health and seeks to: promote the fruit growing industry; assist in the marketing of fresh fruits; provide for establishing of temporary chemical laboratories in the fruit growing sections during the harvesting and shipping season, in order to control excess poisonous spray residue on fruits; provide for the payment of inspection fees for chemical analyses; issue clearance certificates on lots of apples and other fruits prepared for shipment; make an appropriation there for and to prescribe the

duties and powers of the Commissioner of Agriculture.

Prevention of Food Adulteration Act, 1954: An act to make provision for the prevention of adulteration of food. The Act aims to assure a high level of protection of human health and consumers' interests in relation to food. Primary food means any article of food being a produce of agriculture or horticulture in its natural form.

Integrated Pest Management Act and Regulations, 2004: Integrated Pest Management is the use of pest control methods, which minimise harm to beneficial organisms and the environment and a process for managing pest populations. The Ministry of Environment and forest administers the Integrated Pest Management Act and Regulations, which applies to pesticides used on public land; on private land used for forestry, transportation, public utilities and pipelines and for pest control service companies; regulates the sale, use and handling of pesticides in the province; and promotes an Integrated Pest Management approach for managing pests.

The Seeds Act, 1966: It's an Act to provide for regulating the quality of certain seeds for sale and for matters connected therewith. Subsequently, the Seeds (Amendment) Act, 1972 (No. 55 of 1972) was made. It has specified power to notify kinds or varieties of seeds; power to specify minimum limits of germination and purity etc.; regulation of sale of seeds of notified kinds or varieties; restriction on export and import of seeds of notified kinds or varieties; recognition of seed certification agencies of foreign countries.

National Oilseeds and Vegetable Oils Development Board Act, 1983 (No. 29 of 1983): It's an act to provide for development under the control of the Union of the oilseeds industry and the vegetable oils industry and the matter connected therewith. Subsequently, the National Oilseeds and Vegetable Oils Development Board Rules, 1984 were framed under National Oilseeds and Vegetable Oils Development Board Act, 1983 (29 of 1983).

Fertiliser Control Order, 1985: This order vide No.11-3/83-STU, Government of India, Ministry of Agriculture and Rural Development (Department of Agriculture and Cooperation), New Delhi, dated 25th September, 1985, has been made under Section 3 of the Essential Commodities Act. This order covers price control, control on distribution of fertilisers by manufacturer/importer; authorisation or registration of dealers, manufacture of mixtures of fertilisers, organic fertilisers and bio-fertilisers; restrictions on manufacture/import sale etc. of fertiliser. Schedule 1 of this order covers the quality of different types of fertilisers.

This order mandates registration of Industrial dealers and authorisation of other dealers. It states that "no person shall sell, offer for sale or carry on the business of selling of fertiliser at any place as wholesale dealer or retail dealer except under and in accordance with Clause 8, provided that a State Government may, if it considers it necessary or expedient, by notification in the Official Gazette, exempt from the provisions of this Clause any person selling fertiliser to farmers in such areas and subject to such conditions as may be specified in that notification." This order also puts restrictions on the preparation of mixtures of fertilisers and defines conditions for disposal of non-standard fertilisers. The order prescribes procedure for disposal of non-standard fertilisers. This order is enforced through inspectors appointed by State Governments, who have power to enter, inspect, seize and penalise under the provisions of the code of criminal procedure, 1973 (2 of 1974).

The Multi-State Cooperative Societies Act (MSCS), 2002: It's an Act to consolidate and amend the law relating to cooperative societies, with objects not confined to one State and serving the interests of members in more than one State: To facilitate the voluntary formation

and democratic functioning of cooperatives as people's institutions based on self-help and mutual aid and to enable them to promote their economic and social betterment and to provide functional autonomy and for matters connected therewith or incidental thereto. In order to implement this Act, The Multi-State Cooperative Societies Rules, 2002 were formulated. The rules were released under Section 124 of the Multi-State Cooperative Societies Act, 2002 (39 of 2002), by the Central Government.

National Cooperative Development Corporation Act, 1962 (No. 26 of 1962): It's an Act to provide for the incorporation and regulation of a Corporation for the purpose of planning and promoting programmes for the production, processing, marketing, storage, export and import of agricultural produce, foodstuffs, industrial goods, livestock, certain other commodities and services on cooperative principles and for matters connected therewith or incidental thereto. In order to implement this Act, the National Cooperative Development Corporation Rules, 1975 were formulated. Under National Cooperative Development Corporation (NCDC) Act, 1962 (No. 26 of 1962), NCDC Rules, 1975 were framed.

The Patent Second Amendment Act, 2002: The Plant Variety Protection Act is supportive of research on transgenics because of the strong rights it grants to plant breeders. However, it is the Patent Second Amendment Act that makes distinct concessions to the biotechnology sector and the breeding of transgenic crops. According to this Act, process patents will be allowed on microbiological, biochemical and biotechnological processes. In this way, methods of genetic engineering, processes in the pharmaceutical industry using microorganisms and related processes will be patentable.

Processes and methods for making plants resistant to disease and for increasing their value or the value of their products will be patentable. Discoveries, however, will not be patentable under the Indian law. To qualify for a patent, invention will have to be demonstrated. Plants and animals and species of plants and animals have been kept out of the purview of patents, so are plant varieties and seeds. New varieties of crops and their seeds are thus outside the patent system. Though the Indian law permits process patents, this will not apply to the crucial sector of food. Methods and processes of agriculture and horticulture cannot be patented nor can any other biological processes. The Patent Amendment Act also does not allow the patenting of cells, cell lines, cell organelles, like mitochondria and genes.

The Seeds Rules 1968: The Seeds Rules, framed in 1968, made provisions for Central Seed Committee, Central Seed Laboratory, Seed Certification Agency, marking or labelling, certification of seeds, seed analysts and seed inspectors. It also contains a form for seed production under the seed certification programme. Part IV, item k of the rules specifies that the Seed Certification Agency will ensure that seed borne diseases are not present in the field to a great extent than those provided in the standards of certification. Further, Part V, item 8c specifies that marking and labelling should ensure that seed treated with chemicals should not be used for food, seed or oil purpose. Subsequently, the Seeds (Amendment) Rules have been amended in 1973 and 1974; Corrigendum Seeds (Amendment) Rules, 1974 and The Seeds (Amendment) Rules, 1981.

The Seeds (Control) Order, 1983: Under Section 3 of the essential, commodities Act, 1955 (10 of 1955), the said Order deals with dealer in seeds to be licenced and enforcement authority. It also contains form of application to obtain dealer's licence, licence to carry on the business of a dealer in seeds, application for renewal of licence and a schedule for sealing, fastening, despatch and analysis of samples.

Fertiliser Control Order, 1985: The said Order vide No.11-3/83-STU, Government of

India, Ministry of Agriculture and Rural Development (Department of Agriculture and Cooperation) New Delhi, dated 25th September 1985, covers, price control, control on distribution of fertilisers by manufacturer/importer, authorisation or registration of 'dealers', manufacture of mixtures of fertilisers, organic fertiliser and bio-fertiliser, Restrictions on manufacture/import, sale etc. of fertiliser. It defines bio-fertiliser as a product containing carrier based (solid or liquid) living micro-organisms, which are agriculturally useful in terms of nitrogen fixation, phosphorus solubilisation or nutrient mobilisation to increase the productivity of the soil and/or crop.

Insecticides Rules, 1971: In exercise of the powers conferred by Section 36 of the Insecticides Act, 1968 (46 of 1968), the Central Government, after consultation with the Central Insecticides Board, have promulgated these Rules. According to these Rules, the Board has some functions. The Board shall, in addition to the functions assigned to it by the Act, carry out the following functions: Advise the Central Government on the manufacture of insecticides under the Industries (Development and Regulation) Act, 1951 (65 of 1951); specify the uses of the classification of insecticides on the basis of their toxicity as well as their being suitable for aerial application; advise tolerance limits for insecticides, residues and an establishment of minimum intervals between the application of insecticides and harvest in respect of various commodities; specify the shelf-life of insecticides; suggest colourisation, including colouring matter, which may be mixed with concentrates of insecticides, particularly those of highly toxic nature; and carry out such other functions as are supplemental, incidental or consequential to any of the functions conferred by the Act or these Rules.

Notification Floriculture and Seed, 2004-09 S.O (E): In exercise of powers conferred by Section 5 of the Foreign Trade (Development and Regulation) Act, 1992 (No. 22 of 1992) read with Para 1.3 of the Foreign Trade Policy, 2004-2009 (as amended from time to time), the Central Government hereby makes the following amendment in Foreign Trade Policy (RE2008): In third sub para of Para 3.8.2 of FTP RE, 2008, the words 'Flowers, Fruits and Vegetables' are replaced by 'Flowers, Fruits, Vegetables and Other Products'.

Environment (Protection) Act, 1986: This is the most significant and diversified national level Act to safeguard the natural environment. Para 2 of introduction of the Act states that it is an Act to provide for the protection and improvement of human environment and the prevention of hazards to human beings, other living creatures, plants and property. Item 2, Chapter 1 of the act states that 'environment' includes water, air, land and the interrelationship, which exists among and between water, air, land and human beings, other living creatures, plants, micro-organisms and property. 'Environmental Pollution' means any solid, liquid or gaseous substance present in such concentrations as may be or tend to be injurious to environment. Environmental Pollutant means the presence in the environment of any envitonmental pollutant. It is an umbrella Act, which has several rules under it, to address different problems related to environment and pollution control.

The Air (Prevention and Control of Pollution) Act, 1981 (as amended1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

The Water (Prevention and Control of Pollution) Act, 1974 (as amended 1988): This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties

of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal solid wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems, so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of Municipal Solid Wastes.

Farmers' Rights, 2001: The Act recognises the farmer not just as a cultivator, but also as a conserver of the agricultural gene pool and a breeder, who has bred several successful varieties. The Act makes provisions for such farmer's varieties to be registered with the help of NGOs so that they are protected against being scavenged by formal sector breeders. The rights of rural communities are acknowledged as well. Farmers' rights are defined in the following way:

The farmer shall be deemed to be entitled to save, use, sow, re-sow, exchange, share or sell his farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act; provided that the farmer shall not be entitled to sell branded seed of a variety protected under this Act.

Importance of Farmers' Right to Sell Seed: The pivotal importance of the farmer having the right to sell (not save nor exchange, but sell) seed has to be seen in the context of seed production in India. In India, the farming community is the largest seed producer, providing about 87 percent of the country's annual requirement of over 60 *lakh* tons. If the farmer were to be denied the right to sell, it would not only result in a substantial loss of income for him, but far more importantly, such a step would displace the farming community as the country's major seed provider.

Breeders' Rights: Breeders' rights over the varieties they have developed are more than adequately protected by the draft legislation. On registration, the breeder has rights of commercialisation for the registered variety either in his/her own person or through anyone he designates. These rights include the right to produce, sell, market, distribute, import or export a variety, in short, full control over formal marketing. The strong protection granted to a plant breeder over his/her variety is seen in the Section dealing with infringement of breeders' rights where punishment in the form of substantial fines and jail terms have been prescribed for those, who infringe the rights of the registered breeders.

State Level Policies/ Regulations

The Himachal Pradesh Shops and Commercial Establishment Act, 1969, The Himachal Pradesh Shops and Commercial Establishments (Amendment) Act, 2004. (As Assented to by the Governor, Dated 2nd August, 2004): This is an Act to provide for the regulation of conditions of work and employment in shops and commercial establishments.

The Himachal Pradesh Municipal Act, 1994 (As Assented to by the Governor on 18th October, 1994): This Act seeks to consolidate and amend and replace the law relating to municipalities in Himachal Pradesh.

Power of Municipality to Regulate the Manufacture, Preparation and Sale of Food and Drink: The Municipality may, and shall, if so required by the State Government, by bye-laws:

(a) prohibit the manufacture, sale or preparation or exposure for sale, of any specified article of food or drink, in any place or premises not licenced by the Municipality;
(b) regulate the hours and manner of transport within the Municipal area of any specified articles of food or drink, and prescribe the route by which such articles shall be carried;
(c) prohibit the sale of milk, butter, ghee, curd, meat, game, fish and poultry by persons not licenced by the Municipality;
(d) prohibit the import into the Municipal area for sale of milk cream, butter, ghee, curd, meat, game, fish and poultry by persons not licenced by the Municipality;
(e) regulate the grant and withdrawal of licences and the levying of fees, therefore, under this Section; provided that no person shall be punishable for breach of any bye-law made under clause *(a)* of this section by reason of the continuance of such manufacture, preparation or exposure for sale, or sale upon an y premises, which are, at the time of the making of such bye-law, used for each such purpose, until he has received from the Municipality six months' notice in writing to discontinue such manufacture, preparation or exposure for such sale, or such sale in such premises.

Power to Inspect Places for Sale of Food or Drink etc. and to Seize Unwholesome Articles Exposed for Sale: The Municipality or Executive Officer or the Secretary, as the case may be, may authorise any person at all reasonable times to enter into and to inspect any market, building, shop, stall or place for the sale of food or drink for man, or as a slaughter house, or for the sale of drugs, and to inspect and examine any food or drink, animal or drugs, which may be therein; and, if any article of food or drink, or any animal therein appears to be intended for the consumption of man to be unfit, may seize and remove the same or may cause it to be destroyed or to be so disposed of as to prevent its being exposed for sale or used for such consumption; and in case it is reasonably suspected that any drug is adulterated in such mannerastolessenits efficiency or to change its operation or to render it noxious, to remove the same giving a receipt therefore, and to cause the owner thereof to be brought before a Magistrate for enquiry whether any offence has been committed in respect thereof, and for orders as to the disposal of the said drug.

The Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development and Regulation) Act, 2005: This Act was made to re-enact the law to provide regulation in marketing of agricultural produce; development of efficient marketing system; promotion of agro-processing and agricultural exports; establishment and proper administration of markets for agricultural produce in the State. The Act regulates trading and contract farming as under:

- The State Government, on its own or on representation made by growers or on recommendation by Board, may, by notification, declare its intention of exercising control over purchase, storage, processing and sale of agricultural produce.

- The State Government may alter the limits of market area; amalgamate two or more market areas and constitute one committee; split market area and constitute two or more committees; and de-establish a market.

In every market area, there may be market yard, sub market yard and a private yard managed by the committee. If any person wants to establish private yard and wants to purchase agricultural produce directly from agriculturalist, she/he shall make an application for obtaining the licence; consumers or farmers' market may be established by developing infrastructure by any person in any market area and producer may himself sell his agricultural produce

directly to consumers; no person shall undertake contract farming unless registered under Section 40 of this Act; no person may use any place in market area for marketing of notified horticultural produce; and all notified horticultural produce shall be sold in market yards, sub market yards and private yards.

Establishment of Consumer's or Farmer's Markets and Creation of Post Harvest Management Facilities by the Farmers / Agriculturists: Consumer's or farmer's market may be established by developing infrastructure, as may be prescribed, by any person in any market area and the producer may himself sell his agricultural produce directly to the consumer in such market area in the manner as may be prescribed; market service charge shall be collected on sale of agricultural produce by the seller and shall be remitted to the proprietor of the consumer market; save as otherwise provided in this Act, no market fee shall be leviable on the transactions undertaken in the consumer's or farmer's market; and notwithstanding anything contained in this Act, any farmer and agriculturist may, for his bonafide use, create post harvest management infrastructure facilities at the farm level, such as grading, standardisation, pack houses, storages (including cold storages), primary processing of agricultural produce and other post harvest management facilities for which the Central or State Government may provide different scheme shall be implemented along with the scheme under horticultural technology mission being executed by the Department of Horticulture through Directorate of Marketing and Inspection, Government of India.

The Himachal Pradesh Holdings (Consolidation and Prevention of Fragmentation) Act, 1971: This Act was to provide consolidation of agricultural holdings and for preventing the fragmentation of agricultural holdings in the State and for assignment or reservation of land for common purposes of the village. State Government may specify any estate or its subdivision as notified area. State Government may provisionally settle for any class of land in any notified area. No person shall transfer or lease any fragment of the land. No land in any notified area shall be transferred or partitioned to create a fragment. The transfer or partition of any land contrary to provision of this Act shall be void. If the owner of fragment wants to sell it, he should make an application to the Collector for determination of market price.

The Himachal Pradesh Warehouses Act, 1976: This Act seeks to provide for the regulation and licensing of warehouses in the State of Himachal Pradesh. 'Depositor' means a person, who has deposited goods with a warehouseman for storing, and includes any person, who lawfully holds the receipt issued by the warehouseman in respect of such goods and derives, title thereto by a proper endorsement or transfer thereof to him by the depositor or the depositor's lawful transferee; (vegetables, herbal produce and others). 'Goods' means any of the articles specified in the Schedule to this Act. 'Warehouseman' means a person, who has obtained licence under this Act, in respect of his warehouse; and 'warehousing' means the business carried on by a warehouseman under licence granted under this Act and in accordance with such terms and conditions thereof as may, from time to time, be prescribed.

Every warehouseman shall take such care of the goods deposited with him as a man of ordinary prudence would take of his own goods under similar circumstances and conditions. Every warehouseman shall keep his warehouse clean and free from damp, take all necessary precautions against rats and other pests, and fulfil such other conditions as my be prescribed. No warehouseman shall accept such goods for deposit as are likely to damage other goods, which are or may be deposited in the warehouse. Whenever goods deposited in a warehouse begin to deteriorate, he shall forthwith give notice of such fact to the depositor requiring him to take delivery of the goods immediately, after surrendering the receipt duly discharged and paying all charges due to the warehouseman. If the depositor

does not, within a reasonable time as prescribed, comply with a notice given to him under Sub-section (1), the warehouseman may cause the goods to be removed from the warehouse and sold by public auction on such conditions as may be prescribed at the cost and risk of the depositor.

The prescribed authority may, at any time, during business hours, inspect or examine or cause to be inspected or examined any licenced warehouse, its machinery and equipments, goods deposited therein, and the account books and records relating thereto, for the purpose of satisfying itself that the requirements of this Act are met and the Rules are obeyed.

This Act would be applied for the following horticulture goods: Vegetables (Potatoes, Tomatoes, Onion, Chillies); Herbal produce (Dhoop, Karu and Violet-flowers); and others (Gur, Shakkar, Apples, Plums, Peach, Ginger including dry ginger, Lemon, Kuth, Chilgoza, Dias Correa)

Fruit Nurseries Registration Act, 1973: The propagation of fruit plant material in Himachal Pradesh is regulated under the Himachal Pradesh Fruit Nurseries Registration Act, 1973. So far, 732 nurseries have been registered under this Act, out of which 662 nurseries are in the Private Sector and the balance 70 nurseries are in the Public Sector. About two million fruit plants are propagated in these nurseries per annum.

The Himachal Pradesh Warehouses Rules, 1987: Every warehouseman shall maintain his warehouse in accordance with the directions issued by the Registrar from time to time, on this behalf and, in particular, shall keep the warehouse in the following manner: the warehouse shall be damp-proof and rat-proof; the warehouse shall be repaired whenever necessary and shall be kept disinfected; the goods stored in the warehouse shall be arranged and stored in such a manner as to render stock-taking and verification facile and effective; stocks shall not be 1. [stacked] touching the walls and a space of about 60 cm. shall be left; 2. [round], except in the case of a warehouse run by the Central Warehousing Corporation established under the Warehousing Corporation Act, 1962 (Act No. 58 of 1962) and in which the stocks are deposited by the Government, the Food Corporation of India and the Co-operative Societies, the stocks shall not ordinarily exceed 15' x 15' in dimensions and shall not be more than a pile of 15 bags in height; goods of different classes or grades or qualities shall be stored separately; all leakages in the roof, dampness in walls and floors during the monsoons shall be carefully watched and repaired in good time; and all appliances in the warehouse, such as scales, weights, measures, packers and ladders shall be maintained in proper form and in good condition.

Every warehouseman shall keep his warehouse clean, free from straw, rubbish or accumulation of materials, which may increase the risk of fire or may interfere with handling of goods. All goods for storage shall be delivered at the warehouse properly marked and packed for handling. The depositor shall furnish at or prior to such delivery a manifestation action showing marks, brands or sizes to be kept and accounted for separately and the class of storage desired, otherwise, the goods may be stored in bulk or assorted lots at the discretion of the warehouseman and will be charged for accordingly. In the case of deterioration of goods, the warehouseman shall serve the depositor with a notice to remove the goods within a period of one week from the date of receipt of the said notice. On failure of the depositor to remove the goods within the period fixed under rule 30/32, the warehouseman shall proceed to sell the goods by public auction.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities. The *Gram Sabha* shall perform the following functions, namely: mobilise

voluntary labour and contribution in kind and cash for Community Welfare Programmes; identification of beneficiaries for the implementation of developmental schemes pertaining to the village; rendering assistance in the implementation of developmental schemes pertaining to the village; approve plans, programmes and budget prepared by the *Gram Panchayat*, for economic development and social justice; and authorise, after being satisfied, issuance of utilisation certificate of funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

The Agriculture and Industry Committee shall perform functions relating to: agriculture production, animal husbandry, co-operation, contour bunding and reclamation, village and cottage industries, and promotion of industrial development of the district.

Functions of *Gram Panchayats*: Plantation and preservation of *Panchayat* Forests; agriculture, including agricultural extension; and Small Scale Industries, including food processing industries.

State Agriculture Marketing Boards (SAMB)/Departments: The State Government / Marketing Board will provide to the DMI the list of markets to be covered for computer connectivity under the scheme. The selected markets will provide site for installation comprising (1) Dust free computer room; (2) Power requirement; (i) Electrical points- 3 (15 Amp 6 pin sockets with switches), input to be protected by 6 Amp MCB; (ii) 220/230 Volt power supply; (iii) Line, neutral and Earth connection on the specified socket terminals; (iv) Proper Earth Pit copper wire earthing (with earth to neutral voltage less than 3 V) with an exclusive phase; (3) Computer Operator; (4) One telephone with STD facility, wherever required Market Committees/Controlling authorities of AGMARKNET node at market level would continue to collect relevant data and information, feed it and transmit it to the State level and AGMARKNET portal.

The Himachal Pradesh Agricultural Pests, Diseases and Noxious Weeds Act, 1969: The Act was provided for prevention of the introduction, spread or reappearance of pests, plant diseases and noxious weeds injurious to crops, plants or trees in the State. State Government may, by notification:

a) Declare that any insect, vertebrate or invertebrate animal, disease or weed is injurious to plant in any local area as noxious weed.
b) Specify the local area within which and the period during which such declaration shall remain in force.
c) Prohibit/restrict movement or removal of any plant, earth, soil, and manure from one place to another.
d) Prescribe the period within which it shall not be lawful to plant with a specified crop the whole or any portion of notified area.
e) If any pest, plant diseases or noxious weeds appear in any village adjoining a notified area, the *Patwari* of such villages shall report the fact to such officer as the State Government may appoint on this behalf. Whoever removes any plant, earth, soil, manure or other thing may be fined.

Following are related plans and programmes being implemented in the State

Programme for Market News Service: Market news helps the farmers to take decisions about when and how much of a commodity to produce, when and where to sell it etc. Mostly the farmers in the state are poor with meagre or no resources and are not aware of market information. They have to depend upon local traders, commission agents, etc. for market information, who purchase their produce for below the prevailing market rates. In order to avoid the exploitation of farmers, daily market rates of 24 agricultural commodities prevailing in 10 markets of the State are being collected by the market committees and are being broadcasted through All India Radio (AIR), Shimla/Doordarshan.

The nursery production programme needs to be modernised for the production of virus-free certified planting material on suitable rootstock. The planting density of fruit orchards will require new orientation from the present low-density plantation to medium and high density plantations to obtain higher productivity of high quality fruits per unit area.

Market Intervention Scheme (MIS): - The Government of Himachal Pradesh has introduced the policy of Market Intervention Scheme (MIS) for the procurement of Mango, Apple and Citrus Fruits in the State. In order to implement the Market Intervention Scheme of the State Government, the HPMC being the premier fruit marketing agency, procures the unmarketable fruits, which are processed under most hygienic conditions in its processing plants. The efforts made by the Corporation have resulted in stabilising the prices of the fruits in the market. Apart from fruits procured under MIS, HPMC also procures other fruits like Peach, Pear, Plum, Litchi, Almonds, Strawberry, Kiwi etc. grown in the State for marketing and processing to increase the capacity utilisation of the plants and to assist the farmers of the State in getting remunerative returns for their produce.

Area Expansion Programme: Under the area expansion programme, it is proposed to bring 20,000 hectare area under fruit plantation additionally in the State during the 11th Five Year Plan by distribution of 20.00 *lakh* fruit plants annually. Besides this, 10000 hectare area of old and uneconomic orchard is also proposed to be planted during the 11th Five Year Plan. An area of 2000 hectare is proposed to be replanted during the year 2007-08.

Improved Package of Practices: The programme is of great importance in the transfer of technology to the fruit growers in increasing the productivity and quality of fruit crops. The action plan under this programme would be demonstration of the new technology or improved package of practices developed by the State Horticulture University at Nauni, District Solan or any other research institution and industry in the field of farming. The incentives to the fruit growers for implementing this scheme shall be given as per the approved procedure of the State Government. The objectives of the programme are given below:-

1. To effect improvement in the level of management in the existing plantations through the demonstration of new technologies, primarily with a view to maximise production per unit area.
2. To provide opportunities to the fruit growers, specially small and marginal farmers and other weaker sections of farming community, to acquire skills to augment their knowledge and understanding by learning through doing.
3. To provide forum for the farmers to exchange ideas about and experiences of operating under various agro-climatic conditions.
4. To collect data on the impact of the package of practices and the new technologies demonstrated on the yield and quality of fruit crops.

Programme for the Construction of Collection Centres: Due to hilly terrain, the producing areas are scattered in small units. Generally, the means of transport are not readily and easily available in such areas. Farmers bring their produce to the roadside and keep on waiting for transport and traders. Since there is no facility for the protection of agricultural produce, it remains open to vagaries of weather, theft etc. To save the farmer from such losses, a scheme to construct collection centres at strategic points has been started.

The *'Gramin Bhandaran Yojana'* has been launched w.e.f. 01.04.2001. The main objectives of the scheme include creation of scientific storage capacity with allied facilities in rural areas to meet out various requirements of farmers for storing farm produce, processed farm produce, agricultural inputs etc., and prevention of distress by creating the facility of pledge loan and marketing credit. The scheme

has now been made farmer friendly by allowing subsidy for smaller godowns of 50 MT size in general and of 25 MT in hilly areas. Five *lakh* tonnes capacity to be created is reserved for small farmers and the target of construction in the Tenth Plan is enhanced from 90 to 140 *lakh* tonnes.

Plans for Farmer's Awareness Camps: Farmers are not getting adequate yields and returns in relation to their hard work due to inadequate knowledge about post harvest handling and marketing. Thus, farmer's awareness camps are being organised to make them aware of post harvest management, agricultural marketing, market regulations etc. Each training camp comprises of 100 farmers. The officials of Himachal Pradesh Marketing Board, Market Committees, Agriculture and Horticulture Departments Agriculture/Horticulture University etc. also participate in these camps as resource personnel.

Plans for Distribution of Plastic Crates: Fruits and vegetables are highly perishable in nature. The post harvest losses of fruits and vegetables are estimated to the extent of eight to 37 percent. Use of improper packaging material is one of the reasons for these losses. In general, bamboo baskets, gunny bags or wooden boxes are used for packaging, which not only affect the quality of the produce adversely, but also put pressure on the forest. It is, therefore, necessary to encourage farmers to adopt new packaging materials. Keeping in view these facts, plastic crates are distributed among farmers on subsidised rates with the help of the National Horticulture Board. These crates are light in weight, occupy less space, are sturdy, durable and have smooth surfaces. These can be used for collecting, grading and for temporary storage.

Introduction to Improved Plant Material: The Department of Horticulture has been making efforts from the Seventh Five-Year Plan for the introduction of improved varieties of fruits from the advanced countries as well as other states of India for:

i) Improving the quality and productivity of fruit crops;
ii) Diversification in crop production; and
iii) Improving the economic viability of fruit farms.

Programme for Organic Horticulture: Organically grown produce is considered good for health. It fetches better prices in and outside the country. There is a great need to follow the traditional method of organic farming. Much organic material in and around the orchards is being wasted for want of awareness about the use of this product. Vermi compost, Green Manure and the like practices need to be followed.

Development of Storage Facility: Agriculture sector needs well functioning markets to drive growth, employment and economic prosperity in rural areas of the country. In order to provide dynamism and efficiency into the marketing system, large investments are required for the development of post harvest and cold chain infrastructure nearer to the farmers' fields.

Seed Village Programme: Major constraint in increasing production and productivity of crops noted is the inadequacy in making available to the farmers sufficient quantities of quality seeds of improved varieties in time. To overcome this constraint, the Government of India has started a novel programme known as the 'Seed Village Programme' by which sufficient seed multiplication can be achieved in order to meet local seed requirements besides facilitating supply of seeds at reasonable cost and ensuring quick multiplication of new varieties in a shorter time. Under this programme, areas of better seed production will be identified and a compact area approach will be followed. 50 to 150 suitable responding/willing farmers for the same crops will be identified/selected, preferably in compact area/cluster approach. Foundation/certified seed at 50 percent cost will be made available to these identified farmers. The seeds for half an acre per farmer will be allowed. Training on seed production

and seed technology will be imparted to the identified farmers for the seed crops grown in the seed villages. Besides this, assistance @ 33 and 25 percent for SC and ST and other farmers, respectively, is also available for procuring seed storage bins of 20 quintal capacity.

Special Subsidy Scheme: The horticulture production units require huge investment for the installations at initial stages and further maintenance. It is, therefore, proposed to provide assistance in the form of subsidy to the fruit growers to encourage them to take to horticulture and its ancillary activities for their self employment and to generate income.

Entrepreneurial Development Programme for Women Farmers: Since women are inextricably involved in horticulture activities in Himachal Pradesh, there is a need to organise these women by making Self-Help Groups (SHGs) and providing them training in different horticulture activities. They should be empowered and be involved in decision making at the household level. The assistance being provided under this programme is as follows:

@ Rs. 10,000 per district for conducting base line survey.
@ Rs. 20,000 per district for the development of curriculum.
@ Rs. 10,000 per district for conducting refresher training of facilitators.
@ Rs. 1,000/- per woman farmer for attending a training of five-day duration.
@ Rs. 5,000/- for the formation of SHGs.

Development Programme for Floriculture: The main objective of this programme in the district is to earn more income in lesser time span by harnessing diverse agro climatic potentials for the year round production of flower bulbs, seeds, live plants, dry flower etc. The Department is providing a subsidy at the rate of 50 percent on the cost of planting material and other inputs subject to the maximum of Rs. 20,000 for bulbs crops, Rs. 50,000 for grafted/cutting crops and Rs. 4,000 for seeds crops of 0.2 hectare, respectively. Two flower nurseries are located at Bhatoon and Dharamshala which provide input to the growers.

Development Programme for Mushroom: The main objective under this programme is to enhance the production of mushroom by exploiting the agro climatic potential for providing self employment. The Mushroom Development Programme is mainly directed towards improving economic conditions of the farmers. Project Co-ordinator, Mushroom and two Horticulture Development Officers, along with technical staff, are posted to popularise the cultivation of mushroom in the district.

Horticulture Programme: Back-ended capital investment subsidy @ not exceeding 20 percent of the total project cost with a maximum limit of Rs. 25 *lakhs* per project shall be provided under the scheme to these projects, which are found technically and financially viable. However, for the North-Eastern/Tribal/Hilly Areas, maximum limit of subsidy would be Rs.30.00 *lakhs* per project.

Cold Storage Programme: NCDC Vide letter No.NCDC:9-1/98-P(F&V) dated 7.3.200 has circulated details of Capital Investment Subsidy Scheme for the construction /expansion / modernisation of cold storages and storages for horticulture produce. The cost of 5000 MT capacity for new cold storage and expansion of existing capacity would not exceed Rs. 2.00 *crores*. Back-Ended Subsidy (BES) @ 25 percent would not exceed Rs. 50.00 *lakhs* per project, including for the CA/MA Stores and Projects of higher capacity. However, for the projects in the North-Eastern States BES is available @ 33.33%. However, maximum subsidy admissible would be Rs. 60.00 *lakhs*. For modernisation and re-habilitation BES @ Rs. 1000/ton and for storage like onions @ Rs. 2000/ton capacity created/to be created is also available under the scheme.

Initially, the amount of subsidy would also be sanctioned as loan to the State Government

for which a separate account would be maintained by the State Government. No interest on such loan would be charged by NCDC till the completion of the unit in stipulated period of 18 months. On completion, this loan will be converted into subsidy.

Farmers' Training and Education: The Department runs two Training Centres one at, Mashobra, district Shimla and other at Sundernagar, district Mandi. Besides this, farmers training camps are organised at Village, Block and District levels.

Horticulture Development Schemes under 11th Five Year Plan: *Horticulture Information Services:* Himachal Pradesh, where the farming population is located in far flung and difficult areas and the marketing centres for the State's horticultural products are also located all over the country. Taking these factors into consideration, the horticultural information and publicity services need to be properly strengthened, to be able to serve the ever increasing needs of the orchardists of the State through:

1. Publication of farm bulletins, pamphlets, posters, handouts, newsletters, monthly magazines, farming guide and horticultural calendars.
2. Issue of press notes, farm features and special supplements on various aspects of horticultural development for publication in the newspapers and periodicals.
3. Publicity thorough Radio and Television by supplying scripts and recorded tapes of features, talks and timely limits to the orchardists.
4. Setting up of State and Regional Horticultural Museum.
5. Organisation of farmers fairs, horticultural shows, exhibition and horticultural production competitions.
6. Preparation of films and videotapes on horticultural subjects.
7. Publishing the horticultural products of the state through advertisements, hoardings, radio, television, slides and publicity brochures etc.
8. Establishment and maintenance of departmental libraries at directorate and district level.
9. Provision of modern equipments required for preparing publicity materials and other teaching aids etc.

Mini Mission III: This Mini Mission aims to create infrastructural facilities for post harvest management, marketing and export. For this purpose, existing schemes of the NHB, DMI, NCDC, APEDA, NAFED etc., either with the existing outlays or with enhanced outlays, are implemented. The existing approved schemes of National Horticulture Board (NHB) with additional outlays as required will be implemented to give focus.
Source: http://hpagrisnet.gov.in/; Department of Horticulture; Himachal Pradesh

Schemes of National Horticulture Board (NHB)

Scheme-I

Development of Commercial Horticulture through Production and Post Harvest Management.

Scheme-II

Capital Investment Subsidy for Construction / Expansion / Modernisation of Cold Storages/ Storages of Horticulture Produce (1999-2002).

Scheme-III

Technology Development and Transfer. Scheme-IV Establishment of Nutritional Gardens in Rural Areas.

Scheme-V

Market Information Service for Horticulture Crops.

Scheme-VI
Horticulture Promotion Service. These are proposal based schemes, the details of which must be obtained from National Horticulture Board and the proposals must be submitted on the prescribed format of the Board.

Mode of Release of Funds: State Government to submit proposals relating to post harvest management and commercial horticulture as per the schemes of NHB to MD, NHB. Proposals will be approved by the Project Approval Committee. Funds will be released by NHB directly.

DAC will release funds to NHB: Similarly, proposals relating to NCDC, NAFED and APEDA shall be submitted directly to respective organisations, who, in turn, will release the funds.
Source: http://hpagrisnet.gov.in/; Department of Horticulture; Himachal Pradesh

Considering the gap, new components have been proposed in marketing.

A. POST HARVEST MANAGEMENT	
1. Controlled Atmospheric (CA) Storage	Credit linked back ended subsidy @ 33.33% of the project cost of Rs. 16.00 *crores*/unit.
2. Cold Storage	Credit linked back ended subsidy @ 33.33% of the project cost of Rs. 2.00 *crores*/unit.
B. MARKETING*	
Establishment of Marketing Infrastructure	Credit linked back ended subsidy @ 33.33% of the project cost of Rs. 100.00 *crores*.

** The proposals relating to development of Wholesale Markets, Rural Primary Markets, Apni Mandis and State Grading Laboratories are required to be submitted in prescribed Performa to Directorate of Marketing intelligence, Department of Agriculture and Cooperation, GoI, New Delhi.*

NCDC has got its own budget to assist cooperative societies for marketing of horticulture products. However, if additional funds are required, NCDC will submit a proposal to DAC.

Assistance under all schemes of APEDA, particularly, for freight subsidy and for packaging development can be availed as per the existing guidelines of APEDA schemes.

Mini Mission-IV: This Mini Mission will be implemented by Ministry of Food Processing Industries.

Name of Component	% of cost	Rate of assistance	Eligible agencies
1. Promotion of new units	50%	Rs. 4 *crores* and promoter's share should not be less than 20%	PSUs, joint/assisted sector NGOs/Cooperatives.
2. Upgradation/ expansion of existing units	50%	50% of capital cost- maximum Rs. 1 *crore*	-do-
3. Promotional activities for conducting studies, surveys and entrepreneurship development etc.		As per the project based need to be approved by committee	Government academic bodies, NGOs and associations.

These programmes should be credit-linked through Banks/NABARD/IDBI/State Financial Corporations/NERAMAC. In case of additional requirements by MFPI, funds will be provided by the Horticulture Technology Mission. The schemes of MFPI would be implemented as credit linked back ended subsidy through financial institutions / scheduled banks.

Mode of Release of Funds and Submission of Proposals: State Governments to submit proposals as per their needs on the above components to MFPI.

The proposal should have the approval of the State Level Steering Committee. The Horticulture/Nodal Officer should know the things.

After approval of the project by state level committee, the Project Approval Committee of

MFPI will further approve the projects and recommend release of funds to SFAC.

Organisational Structure and Implementation: The scheme will be implemented through Small Farmer's Agri-business Consortium (SFAC), except programmes of ICAR, NHB, APEDA and NCDC.

Horticulture Development Schemes

Marketing and Quality Programme Services: (a) Survey of Markets under market intelligence scheme; (b) two days training in post harvest management/picking, grading and packing of fruits; (c) procurement of fair average quality fruit (Apple, Citrus and Mango) under market intervention scheme.

Incentives and Subsidy: (a) Procurement of fair average quality fruit (Apple, Citrus and Mango) under market intervention scheme at minimum support price fixed by the Government from year to year; (b) two days training in post harvest management/picking, grading and packing of fruits- Rs. 45.75+5.00 per day per farmer.

Source: http://hpagrisnet.gov.in/; Department of Horticulture; Himachal Pradesh

Agricultural Marketing: This is regulated in the State through new APMC Act, 2003. The Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development and Regulation) Act, 2005. At present, 10 Market Committees are functioning and 45 markets have been made functional. Market fee @ one percent is levied on buyers. Information on daily market rates is also disseminated through All India Radio/Doordarshan/Agrimarknet.

Agricultural Economics and Statistics: Under this programme, three Centrally Sponsored Schemes, viz. (i) Timely Reporting Schemes (TRS) for estimation of area and production of crops; (ii) Improvement of Crop Statistics (ICS) for bringing quality in the land record data at grassroots level; and (iii) Estimation of Production of Commercial crops like Potato and Ginger. The estimation is done according to statistical techniques. Production estimates on principal crops, like Wheat, Barley of Rabi season and Maize, Paddy, Potato and Ginger crops of Kharif are released on the basis of results of crop cutting experiments conducted according to Random Sampling Method. The Director of Land Records is the agency in the State responsible for collection and release of area estimates, forecast report etc.

***Rashtriya Krishi Bima Yojana* (RKBY):** The State Government has adopted this Scheme from Rabi 1999-2000 season. Crops covered under this scheme are Wheat, Barley, Maize, Paddy and Potato. 50 percent subsidy in premium was allowed to small and marginal farmers on sunset basis. The scheme is compulsory for farmers who have taken loan and optional for farmers who have not taken loan. The scheme provides comprehensive risk insurance against yield losses, viz. drought, hailstorm, floods and pests, disease etc. The Agriculture Insurance Company of India (AICI) is implementing the scheme. The farmers of the State can get benefit out of this programme. State and Government of India share the losses equally. The subsidy on premium has been raised from 10 to 50 percent to small and marginal farmers. From Kharif, 2008 season, Ginger crop of district Sirmaur has also been taken up on Pilot basis for coverage under the Crop Insurance Scheme. Besides this, Tomato and Potato in Solan and Kangra/Una, respectively have been covered under Weather Based Crop Insurance Scheme (WBCIS).

Rural Infrastructure Development Fund (RIDF): The Department of Agriculture is participating in RIDF for creation of irrigation potential through minor irrigation / Water Harvesting Structure. The Department got funds under RIDF-V during 1999-2000, where NABARD sanctioned 157 Flow Irrigation Schemes amounting to Rs. 14.85 *crores,* which has created irrigation potential for 3,560 hectares. These schemes are being executed

through Water Users Associations, who will also maintain them after their completion. Under RIDF-VI, 140 Flow Irrigation Schemes were proposed to NABARD, which have been sanctioned for Rs. 11.37 *crores* covering an area of 3,031 hectares. Under RIDF-VII, 125 Minor Irrigation Schemes schemes worth Rs. 7.84 *crores* have been sanctioned, which will create Culturable Command Area (CCA) of 2,395 hectares. Besides, 90 water harvesting projects have been sanctioned for Hamirpur Distt. under RIDF-VII with cost of Rs. 6.78 *crores*. Under RIDF-IX, 200 minor irrigation schemes amounting to Rs. 8.32 *crores* have been executed creating CCA of 7,161 hectares. Under RIDF-XII, 118 minor irrigation schemes amounting to Rs. 10.74 *crores* have been executed creating CCA of 1512.03 hectares during 2006-2007. During the year 2007-2008, an amount of Rs. 9.58 *crores* has been incurred creating CCA of 1821.71 hectares. During 2008-2009, an amount of Rs. 12.00 *crores* has been incurred by creating CCA of 1104.22 hectares. During 2009-2010, an amount of Rs. 7.50 *crores* has been proposed for minor irrigation/water harvesting projects.

2.9 Rural Planning

The policies and laws applicable and/or related to rural development and planning of the State, along with a brief description of their relevance, are listed below. Detailed explanations can be acquired from the websites of relevant Departments, line Ministries, like Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Rural Development (www.rural.nic.in), Department of Town and Country Planning (http://himachal.gov.in/tcp), Department of Rural Development, Himachal Pradesh (http://hprural.nic.in) and other related agencies.

Constitution of India

The directive principles ensure that the State shall strive to promote the welfare of the people by promoting a social order in which social, economic and political justice is informed in all institutions of life. Also, the State shall work towards reducing economic inequality as well as inequalities in status and opportunities, not only among individuals, but also among groups of people residing in different areas or engaged in different vocations.

The most important aim of Planning is to identify a process of development, which will raise living standards and open out to the people new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads: modernisation, growth, self reliance and social justice. Rural development and poverty alleviation have been the major areas of concern and thrust for the nation since independence. The Community Development Programme consisting of various sets of schemes was launched on 2nd October, 1952 throughout the country with the objective of overall development of rural areas with the active participation of the community. Development Blocks were created and considered pivotal for planning and implementation of various rural development schemes.

Panchayati Raj Institutions at various levels are being involved in the planning and execution of poverty alleviation and employment generation programmes, so as to ensure that the benefits under these programmes reach the right person.

There shall be constituted in every State at the district level a District Planning Committee to consolidate the plans prepared by the *Panchayats* and the Municipalities in the district and to prepare a draft development plan for the district as a whole.

Every District Planning Committee shall, in preparing the draft development plan, will consider: (i) matters of common interest between the *Panchayats* and the Municipalities including spatial planning, sharing of water and other physical and natural

resources, the integrated development of infrastructure and environmental conservation; (ii) the extent and type of available resources, whether financial or otherwise.

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralised public health system by establishing new infrastructure in deficient areas and by upgrading the infrastructure in the existing institutions.

The Policy hoped that the independently stated policies and programmes of the environment related sectors be smoothly interfaced with the policies and the programmes of the health sector, in order to reduce the health risks to the citizens and the consequential disease burden.

This Policy welcomes the participation of the Private Sector in all areas of health activities – Primary, Secondary and Tertiary. The policy recognises the significant contribution made by NGOs and other institutions of the civil society in making available health services to the community. It also emphasises the need to simplify procedures for Government – civil society interfacing in order to enhance the involvement of civil society in public health programmes.

National Rural Health Mission (2005-12): The National Rural Health Mission (NRHM) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 States including Himachal Pradesh, which have weak public health indicators and/or weak infrastructure. It has as its key components, a village health plan prepared through a local team headed by the Health and Sanitation Committee of the *Panchayat*; and integration of vertical Health and Family Welfare Programmes and funds for optimal utilisation of funds and infrastructure and strengthening the delivery of primary healthcare. It aims at effective integration of health concerns with determinants of health like sanitation and hygiene, nutrition and safe drinking water through a district plan for health. The major goals of NRHM include reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR) and universal access to public health services, such as water, sanitation and hygiene.

The Plan of Action of this Mission has ten components. These components include district health plan, converging sanitation and hygiene, Public-Private Partnership for public health goals. The mission envisages the following roles for PRIs: The Village Health Committee of the *Panchayat* would prepare the Village Health Plan (VHP) and promote inter-sectoral integration. Provision of training to members of PRIs is also given in the mission.

The National Water Policy, 2002: National level policy addresses the water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. Policy states about the use of water, water conservation and quantification of water pollution.

Section 1.2 states that rivers and underground aquifers often cut across State boundaries. Water, as a resource, is one and indivisible. Therefore, rainfall, river waters, surface ponds and lakes and groundwater are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of the project implementation.

Section 14.5 states that necessary legislation is to be made for preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources,

the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, including hydrometeorology; snow and lake hydrology; surface and groundwater hydrology; assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; soils and material research; economical designs for water resource projects, sedimentation of reservoirs, prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; and environmental impact and regional equity.

The National level Policy addresses the water issues including prioritisation, allocation, pricing and inter-state issues related to water sharing. Policy states about the consumptive use of water, water conservation and quantification of water pollution. It states that water allocation priority should broadly be in the order of drinking water, irrigation, hydropower, ecology, agro industries and non-agriculture industries, navigation and other uses.

National Electricity Policy, 2005: In compliance with Section 3 of the Electricity Act 2003, the Central Government hereby notifies the National Electricity Policy. Electricity is an essential requirement for all facets of life. It has been recognised as a basic human need. It is a critical infrastructure on which the socio-economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for its overall development. Equally important is availability of reliable and quality power at competitive rates to Indian industry to make it globally competitive and to enable it to exploit the tremendous potential of employment generation. Services sector has made significant contribution to the growth of Indian economy. Availability of quality supply of electricity is very crucial for the sustained growth of this segment.

Recognising that electricity is one of the key drivers for rapid economic growth and poverty alleviation, the nation has set itself the target of providing access to all households in the next five years. As per Census 2001, about 44 percent of the households do not have access to electricity. Hence, meeting the target of providing universal access is a daunting task requiring significant addition to capacity generation and expansion of the transmission and distribution network.

The National Electricity Policy aims at achieving the following objectives:

- Access to electricity - Available for all households in next five years.
- Availability of power - Demand to be fully met by 2012. Energy and peaking shortages to be overcome and adequate spinning reserve to be available.
- Supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates.
- Per capita availability of electricity to be increased to over 1000 units by 2012.
- Minimum lifeline consumption of one unit/household/day as a merit good by year 2012.
- Financial turnaround and commercial viability of electricity sector.
- Protection of consumers' interests.

The policy seeks to address the following issues:

- Rural electrification
- Generation
- Transmission
- Distribution
- Recovery of cost of services and targeted subsidies.
- Technology development and Research and Development (R&D)
- Competition aimed at consumer benefits
- Financing power sector programmes, including Private Sector participation.
- Energy conservation

- Environmental issues
- Training and human resource development
- Cogeneration and non-conventional energy sources
- Protection of consumer interests and quality standards

The National Electricity Policy aims at laying guidelines for accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics of generation using different resources and energy security issues.

The key development objective of the power sector is the supply of electricity to all areas including rural areas as mandated in Section 6 of Part II of the Electricity Act, 2003. Both the Central and State Governments would jointly endeavour to achieve this objective at the earliest. Consumers, particularly those who are ready to pay a tariff, which reflects efficient costs, have the right to get uninterrupted twenty-four hours supply of quality power.

The National Environment Policy (NEP), 2006: Sustainable development concerns in the sense of enhancement of human well-being, broadly conceived, are a recurring theme in India's development philosophy. The National Environment Policy is intended to mainstream environmental concerns in all development activities.

The dominant theme of this Policy is that while conservation of environmental resources is necessary to secure livelihoods and well-being of all, the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation, rather than from degradation of the resource.

Objectives of the National Environment Policy include: i. Conservation of Critical Environmental Resources; ii. Intra-generational Equity: Livelihood Security for the Poor; iii. Inter-generational Equity; iv. Integration of Environmental Concerns in Economic and Social Development; v. Efficiency in Environmental Resource Use, viz. Environmental Governance; vii. Enhancement of Resources for Environmental Conservation.

Principles of the Environment Policy include: Human Beings are at the Centre of Sustainable Development Concerns; The Right to Development; Environmental Protection is an Integral part of the Development Process; The Precautionary Approach; Economic Efficiency; Polluter Pays; Entities with 'Incomparable' Values; and Equity.

It states that action plans would need to be prepared on identified themes by the concerned agencies at all levels of Government - Central, State / Union Territories and Local. These include: Enhancing and conserving environmental resources; Environmental standards, management systems, certification and indicators; Clean technologies and innovation; Environmental awareness, education, and information; Partnership and stakeholder involvement; Capacity building; Research and development; International cooperation; Review of the policy; Review of implementation.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on

Strategic Knowledge for Climate Change.

National Conservation Strategy and Policy Statement on Environment and Development, 1992: The national conservation strategy and the policy statement on environment and development are in response to the need for laying down the guidelines that will help to weave environmental considerations into the fabric of national life and of development process. It is an expression of commitment for reorienting policies and actions in unison with the environmental perspective.

Wetlands are referred to notably in Section 2.7 of the statement "Our unique wetlands, rich in aquatic and bird life, providing food and shelter as also the breeding and spawning ground for the marine and fresh water fishes, are facing problems of pollution and over-exploitation."

Section 3.4 on Conservation of Forests and Wildlife refers to "Management Plans for identified wetlands, mangrove areas and coral reefs."

Section 4.0 on constraints and agenda for action states about action. The agenda for action in this regard will include the following to conserve and nurture the biological diversity, gene pool and other resources through environmentally sustainable development and management of ecosystems, with special emphasis on our mountain, marine and coastal, desert, wetland, riverine and island ecosystems.

Section 5.2 on Conservation of Natural Resources describes conservation of wetlands for ensuring sustainable ecological and economic benefits.
Subsection 5.2.3 mentions about conservation of biodiversity through a network of protected areas including Biosphere Reserves, Marine Reserves, National Parks, Sanctuaries, Gene Conservation Centres, Wetlands, Coral Reefs and such other natural habitats of biodiversity. This should include taxonomic and ecological studies on the flora and fauna with adequate emphasis placed on the lower vertebrate, invertebrate and micro-flora, which are important in contributing to the healthy maintenance of ecosystems.

Notification on Protection and Improvement of Quality of Environment in the Himalayas, 2001: This Notification was issued by the Ministry of Environment and Forests under the Environment (Protection) Act 1986, specifically for environmental protection in the Himalayan States. The activities relate to location planning in urban areas, rainwater harvesting and guidelines for construction of hill roads.

National Policy on Resettlement and Rehabilitation (R&R), 2007: The National R&R Policy, 2007 provides for the basic minimum requirements, and all projects leading to involuntary displacement of people must address the rehabilitation and resettlement issues comprehensively. The State Governments, Public Sector Undertakings or agencies, and other requiring bodies shall be at liberty to put in place greater benefit levels than those prescribed in the NRRP-2007.

The Policy addresses the need to provide succour to the asset-less rural poor, support the rehabilitation efforts of the resource poor sections, namely small and marginal farmers, Scheduled Casts / Scheduled Tribes and women, who have been displaced. Besides, it seeks to provide a broad canvas for an effective dialogue between the Project Affected Families (PAF) and the administration for Resettlement and Rehabilitation (R&R) to enable timely completion of project with a sense of definiteness as regards costs and adequate attention to the needs of the displaced persons. The objectives of the policy are to: minimise displacement; plan the R&R of Project Affected Families including special needs of tribals and vulnerable sections; provide better standard of living to Project Affected Families; and facilitate harmonious

relationship between the requiring body and PAFs through mutual cooperation.

National Tourism Policy, 2002: It advocates sustainability as a guiding star of tourism. It states that development and management strategies should be so worked out as to ensure that tourism largely acts as a smokeless industry and its ecological footprints remain as soft as possible. Neither over-exploitation of natural resources should be permitted nor the carrying capacity of the tourist-sites ignored.

It lays greater emphasis on eco-tourism, whose parameters should be broader than those of nature tourism alone. It must help in eliminating poverty, ending unemployment, creating new skills, enhancing the status of woman, preserving cultural heritage, encouraging tribal and local crafts, improving overall environment and facilitating growth of a more just and fair social order.

The Policy states that deep-rooted relationship of tourism and our cultural assets should be fully recognised. It further states that improvements and environmental upgradation of the protected monuments and the areas around them should be considered as a linchpin of the tourism industry.

It recommends that at the institutional level, a framework would have to be evolved, which is Government-led, Private Sector driven and community-welfare oriented. Government has to provide a legislative framework to regulate tourism, trade and industry, ensure safety and security of the tourists and create basic infrastructure and health-care facilities. The Private Sector has to act as a main springboard of activities and impart dynamism and speed to the process of development as well as conservation.

It states that effective linkages and close coordination should be established with such Departments as Tourism and Civil Aviation, Environment, Forest, Railways Home etc.

Environment (Protection) Act, 1986: It is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991, has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve the environment, which includes water, air and land and the inter relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment (Protection) Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

The Water (Prevention and Control of Pollution) Act 1974, (Amended, 1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended in 1988, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies.

The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act on Prevention and Control of Water Pollution deals with the Power of the State Government to restrict the application of the Act to certain areas; Power to obtain information; Power to take sample of effluents and procedure to be followed; Seek reports of the result of analysis on samples taken under Section 21; Power of entry and inspection; Prohibition on use of stream or well for disposal of polluting matter etc; Restrictions on new outlets and new discharges; Provision regarding existing discharge of sewage or trade effluent; Refusal or withdrawal of consent by State Board; Appeals; Revision; Power of State Board to carry out certain works; Furnishing of information to State Board and other agencies in certain cases; Emergency measures in case of pollution of stream or well; Power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and Power to give directions.

The Water (Prevention and Control of Pollution) Cess Act, 1977 (Amended in 1992 and 2003): This Act seeks to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

The Air (Prevention and Control of Pollution) Act, 1981 (as amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

Environment Impact Assessment (EIA) Notification, September 14, 2006: EIA notification makes Environment Impact Assessment study mandatory for only those sewage sector development project having more than 10000 hectares of command area. A water supply project does not require prior environment clearance notification as per EIA notification. However, the potable water requirements and services in Industrial estates/parks/complexes/areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes Building (item 7c) and Construction projects, Townships and Area Development projects item 8 (a) and 8 (b) are covered by the said notification.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment Protection Act are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Municipal Solid Wastes (Management and

Handling) Rules, 2000: Section 3 defines disposal of Municipal Solid Wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for the collection, segregation, storage, transportation, processing and disposal of Municipal solid wastes.

Bio-Medical Waste (Management and Handling) Rules, 1998 (as amended in 2003): Rules apply to all, who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining to or in production or testing of biologicals. Section 4 of these Rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect on human health and environment.

National Electricity Act, 2003: Electricity Act, 2003 provides an enabling framework for accelerated and more efficient development of the power sector, which, in turn, results in availability of quality supply of electricity to consumers at competitive rates. The salient features of this policy are: access to electricity - available for all households in next five years; availability of power - demand to be fully met by 2012. Energy and peaking shortages to be overcome and adequate spinning reserve to be available; supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates; per capita availability of electricity to be increased to over 1000 units by 2012; minimum lifeline consumption of one unit/household/day as a merit good by year 2012; financial turnaround and commercial viability of electricity sector; and protection of consumers' interests. This act mandates concurrence of hydropower projects (R&R) from CEA.

Energy conservation Act, 2001: According to this Act, the usage of energy should be kept at minimum both at the point of generation as well as at the point of application. These include short term as well as long term measures. The short term measures include: energy conservation, energy audit of government buildings and capacity building amongst departments to take up energy efficiency programmes. The long term measures include: industry specific task forces, notifying more industries as designated consumers, conduct of energy audit amongst notified designated consumers, recording and publication of best practices (sector-wise), development of energy consumption norms and monitoring of compliance with mandated provision by designated consumers.

Wetlands (Conservation and Management) Rules, 2010: Ministry of Environment and Forests notified rules for conservation and management of wetlands, namely, Wetlands (Conservation and Management) Rules, 2010. The Rules set regulatory framework for conservation of wetlands, and enlists some of the activities, which are prohibited and others, which need to be regulated. Categorisation of wetlands has also been proposed on the basis of significance of the functions performed and for determining the extent and level of regulation. The Rules have been framed for protected wetlands to set restrictions on activities within wetlands, and has made provisions for setting up Central Wetlands Management Authority. The Rules defined the process of identification of wetlands under different categories. The rules also identified overlapping provisions, and enforcement of regulated activities

State Level Policies / Regulations

State Water Policy: The said Policy states that water, as a resource, is one and

indivisible: rainfall, river waters, surface ponds and lakes and groundwater are all part of one system. In Himachal Pradesh, the availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul and Spiti district to around 3200 mm in Dharamshala, district Kangra. However, in spite of heavy rain and snow during the rainy season and winter, the summer months are periods of water scarcity in many areas as the flow in the rivers and *nallahs* are quite low and traditional sources also dry up. Thus, through its Water Policy, the State also has to address the issues of drought management in some areas and flood control in others.

The Policy states about the requirement of clear guidelines with respect to water related projects. Planning and implementation of water related projects have many socio-economic aspects and issues, such as environmental sustainability, resettlement and rehabilitation of project-affected people and livestock, public health concerns of water impoundment, dam safety etc.

It states that water resources available to the State should be brought within the category of utilisable resources to the maximum possible extent. Groundwater exploitation for domestic use and irrigation will be promoted wherever feasible and improvising of surface water in pondages for usage during lean periods shall be encouraged.

The Policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual development projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin, so that the best possible combination of options can be selected and sustained."

The Policy recommends watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

The State level Policy deals with the process and quality of drinking water supply and sanitation means in different areas of the State, mostly in rural sectors. The policy links water harvesting practices in households and community. It assigns duties and responsibilities to *Panchayati Raj* Institutions (PRIs) and Non Government Organisations for source development and water allocation. It stresses on awareness for development of optimal and efficient use of drinking water. Further, the said Policy emphasises on non-conventional methods for augmenting the availability of water, such as artificial recharge of groundwater and traditional water conservation practices, like Rain Water Harvesting, including Roof-top Rain Water Harvesting. The use of such water through dual plumbing systems in all buildings needs to be promoted. Pilot projects will be supported for demonstration effect. Research and development in these areas shall also be supported.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or

affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies and innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation; ecology; afforestation/biodiversity/tourism; agro-industries; hydro-power; non-agro-based industries; and navigation and other uses.

Tourism Policy, 2005: This Policy document aims to provide clear directions for the development of tourism in the State. It seeks to harness the fullest potential of the State for development of tourism, which, in turn, can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The major objectives of the Policy are to: (1) establish Himachal Pradesh as a leading tourist destination in the country and abroad; (2) make tourism a prime engine for economic development and prosperity of the State and as a major means for providing employment; (3) encourage a strong and sustainable Private Sector participation in creation of tourism infrastructure, especially through Public Private Partnerships; (4) promote sustainable tourism, which is not only environmentally compatible, but also leads to economic betterment of the rural people; (5) attract quality tourists and to increase their stay in the State; (6) safeguard the State's natural and manmade heritage; (7) encourage civil societies and Non-Governmental Organisations for the promotion and conducting of tourism related activities; (8) and position Himachal Pradesh as a one stop destination for adventure tourism.

The Government proposes to replicate Manali model of collection of green fee from tourists in other major tourism destinations. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plans will be created and implemented in time bound manner.

The State Government will take steps to ensure proper hygienic conditions and prevent the exploitation of tourists on National and State Highways and at tourist places. The Government proposes to classify the *dhabas* situated on the National and State highways. The classification will be done on the basis of facilities provided, hygienic condition, quality of the food, availability of toilets, parkings etc.

Revised Policy on Development of Eco-Tourism in Himachal Pradesh, 2005: The Revised Eco-Tourism Policy aims to bring the wilderness of Himachal closer to the tourists visiting the State and, at the same time, attempts to put in place adequate safeguards and systems leading to the preservation of these natural resources.

The Policy states that ecological and environmental concerns would form an important component of the Tourism Master Plans for popular destinations. Revenues generated would be ploughed back for the maintenance and preservation of the environment. The Department of Forest would constantly evaluate the project and if it is found that Community Based Eco-Tourism (CBET)/Eco-Tourism norms and concepts are not being followed, the project will be terminated forthwith.

HP Forest Sector Policy, 2005: The forest sector policy introduced a 'Forest Sector Concept', where it encompasses the entire biophysical and environmental components comprising lands and biological resources (i.e., watersheds, wetlands, wildlife) and includes

the stakeholders and institutions directly or indirectly dependent on or responsible for the management of these resources for livelihood security and sustenance and conservation and water harvesting. It also emphasises on watershed management.

The Himachal Pradesh Panchayati Raj Act, 1994: This Act seeks to consolidate, amend and replace the law relating to Panchayats with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

The *Gram Sabha* shall perform the functions as follows: (a) mobilise voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identification of beneficiaries for the implementation of development schemes pertaining to the village; (c) rendering assistance in the implementation of developmental schemes pertaining to the village. It would:

- Approve plans, programmes and budget prepared by the *Gram Panchayat*, for economic development and social justice.
- Authorise, after being satisfied, issuance of utilisation certificate of funds spent on the implementation of plans, projects and programmes of the *Gram Panchayat*.

The *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for their maintenance and repair, like (a) deepen or otherwise improve water ways; and (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act has special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall be responsible for (i) approving plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat*, at the village level; and (ii) identifying or selecting persons as beneficiaries under poverty alleviation and other programmes.

Management of minor water bodies in the scheduled area: Planning and management of minor water bodies in the scheduled areas shall be entrusted to the *Gram Panchayats*, *Panchayat Samitis* or the *Zila Parishads*, as the case may be, in such manner as may be prescribed.

Chapter-XII of this Act describes the preparation of development plans and District Planning Committee. Preparation of development plans includes the following steps: (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) Every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the *Zila Parishad*, *Panchayat Samitis*, *Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This Act seeks to prevent throwing or depositing non-

biodegradable garbage in public drains, roads and places open to public view and to regulate the use of non-biodegradable materials in the State. The Act prohibits throwing degradable garbage in public drains and sewage and has provision for placement of receptacles and places for deposit of non-biodegradable garbage. It defines duty of owners and occupiers to collect and deposit non-biodegradable garbage etc and defines power of local authority for removal of non-biodegradable garbage. It stresses on studies, research and support programmes.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This is an Act to re-enact a law relating to registration of persons engaged in tourist trade, constitution of the Tourism Development Board and other matters connected therewith. This Act defines functions of Tourist Development Board under Section 8 of Chapter II.

Section 17, Chapter III of the Act states about the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the functions of the council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spots, environmental upgradation etc.; assist the local body in maintaining sanitation and infrastructure facility at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities; and prepare a Tourism Master Plan for its area to which all tourism units and establishments therein shall conform.

Government of Himachal Pradesh has constituted Tourism Development Council for Shimla and Mandi under Himachal Pradesh Tourism Development and Registration Act, 2002. The functions of Tourism Development Council are to provide and maintain tourism related services; assist the local body in maintaining infrastructural facilities at tourist spots; build and maintain tourism and recreational facilities, which may enhance the tourism value of the area; prepare tourism master plan for the area; and maintain and operate a tourism destination fund.

The council can also raise the resources for development of infrastructure and facilities by way of fees, cess etc. However, tourism destination fund has yet not been established for Shimla. Besides, Tourism Development Council for Manali and Kullu districts has also been constituted vide notification no. tsm F3-2/2003-I dated 7.7.2004.

The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act No. 32 1976): This Act seeks to provide for the preservation of ancient and historical monuments, archaeological sites and remains, other than those of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

Section 16 of this Act states about the protection of place of worship from misuse, pollution or desecration. A protected monument maintained by the Government under this Act, which is a place of worship or shrine, shall not be used for any purpose inconsistent with its character.

The Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implementing the provisions of the Act, may (a) Issue guidelines for adoption of Rain Water Harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural and urban areas; (d) undertake Information, Education and Communication activities, including workshops, seminars,

public discourses, debates, radio and television programmes, to promote Rain Water Harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of Rain Water Harvesting for groundwater recharge in the notified areas provided that in urban areas within the notified area, no directions issued under these rules shall be applicable for the construction of rain water harvesting structures, e.g.: (a) in residential or commercial premises having plinth area of less than100 square metres; or (b) in the sinking zones, where construction of Rain Water Harvesting Structures would be detrimental to the safety of the building structures in the area.

Himachal Pradesh Public Records Act, 2006 (Act No.24 of 2006): It's an Act to regulate the management, administration and preservation of public records of the State Government, public sector undertakings, statutory bodies and corporations, commissions and committees constituted by the State Government and matters connected therewith or incidental thereto. Under the said Act, Himachal Pradesh Public Records Rules were framed in 2008.

Land Acquisition (Companies) Rules, 1963: In exercise of the powers conferred by Section 55 of the Land Acquisition Act, 1894 (1 of 1894), the Central Government made rules for the guidance of the State Government and the Officers of the Central Government and of the State Governments.

Notification No. IPH-B(C) 10-1/2004, Shimla-1712002, Dated the 15/6/2005 under Section 5 of the Himachal Pradesh Water Supply Act, 1968 (Act No. 8 of 1969), the tariffs related to water are given in Table 10.

Table 10: Rural Water Supply Sector

	Domestic rate	Commercial rate
Connection charges	Rs. 100/-	Rs. 200/-
Consumption charges	Rs. 10/- per connection per month	Rs. 8 per KL subject to minimum of Rs. 100/- per month

This tariff will increase by 10 percent on the 1st of April every year.

Notification No. IPH-B (F) 10-3/2004, Dated, Shimla-2, 23.3.3007: A penal levy for non metering of domestic drinking water connection @ of Rs. 60 per connection per month within two months from the issuance of this Notification to ensure that metres are installed. This rate will be doubled every four months in the event of continued non-metering.

Commercial urban and rural consumers of drinking water will install the metres within one month from the date of this notification. Till then, the average consumption being charged at present will continue. If metres are not installed within one month, the average rate of consumption charges will be doubled. To ensure the installation of metres, this rate will double every two months thereafter.

Himachal Pradesh Town and Country Planning (Amendment) Rules, 2009: In Appendix-I appended to the Himachal Pradesh Town and Country Planning Rules, 1978, after serial number 19, the following shall be added, namely 20. Solar Passive Design. The Amendment defined scope of Solar Passive Building Design as required in the buildings. The scope includes (i) All the Government and Semi-Government buildings, Public and Semi-Public Institutions including educational, health, community centres, banquet halls, inns and buildings of autonomous bodies; (iii) Urban Local Bodies and *Panchayati Raj* Institutions; (iv) Residential buildings in urban and urbanisable areas; (v) Residential colonies and apartments; (vi) Commercial complexes and buildings related thereto including hotels, resorts, lodges and

guest houses; (vii) Industrial buildings and complexes thereof; (viii) Transport buildings, such as Airport terminals, Bus terminals, Railway stations etc.; and (ix) New townships. The amendment also defines specifications of Building Map, Site Selection, Planning of Spaces, Integrating Solar Heating Systems in Building Designs, Solar Photovoltaic Panel (SPV) for lighting, Solar Passive Cooling Design Features, Reducing thermal losses, Outer Wall Thickness and Installation of Solar assisted Water Heating System in Buildings.

Himachal Pradesh Fisheries Act, 1976, Section 3 of the Act: It mentions the power to make rules for prohibition and licencing of fishing in selected waters. Sub-section 3 states that such rules may:

a. Prohibit or regulate all or any of the following matters - i. the erection and use of fixed engines; ii. the construction, temporary or permanent, of weirs, dams and bunds; and killing of fish by diversion of natural waters; and iii. the dimension and kinds of fishing gears to be used and the mode of using them.

b. Prohibit fishing except under licence and regulate the granting of such licences, the fees payable therefore and the conditions to be inserted therein.

c. Prohibit the destruction or attempt to destroy fish by gun, spear, bow and arrow or like instrument or pollution of waters by trade effluents.

d. Prescribe seasons in which the killing or catching or sale of any fish of any prescribed species shall be prohibited.

e. Prescribe a minimum size or weight below which no fish or any prescribed species shall be caught, killed or sold.

f. Prohibit fishing in any specified water for specified period.

g. Require the owner, mortgage with possession or lease of any tank or *jhil* for the stocking of such tanks or *jhils* with any class or classes of fish.

h. Prescribe the formation of associations or societies and the collection of funds for the uplift of fishermen and promotion of fishing industry.

i. Regulate the marketing of fish and also purchase and use of fish for preservation or for the manufacture of any fish products.

j. Regulate the possession of fishing craft and gear within such specified limits as may appear to be necessary.

k. Regulate the transport of all fish or of certain species of fish or fish products within specified limits as may appear to be necessary

Section 6 stipulates Punishment for Destruction of Fish by Explosives: If any person uses any dynamite or other explosive substances in any water with intent thereby to catch or destroy any fish, that may be therein, he shall be punishable with imprisonment for a term, which may extend to three years or with fine, which may extend to five thousand rupees or with both.

Section 7 stipulates punishment for destruction of fish by poisoning water: If any person puts any poison, bleaching powder, lime or noxious material into any water with intent thereby to catch or destroy any fish, he shall be punishable with imprisonment for a term, which may extend to three years or with fine, which may extend to five thousand rupees, or with both.

Sub Section 7-A stipulates punishment for the possession of dynamite and other explosive substance to be used for killing the fish. If a person is found to be in possession of dynamite or any other explosive substance for the purpose of killing the fish near or in the vicinity or on the bank of a river, rivulet, *khad*, pond, lake, reservoir, which are inhabited by the fishes, shall, unless he

explains satisfactorily that his possession or control over such a dynamite or the explosive substance was for a lawful object, he is punishable with imprisonment for a term, which may extend to two years or with fine, which may extend to three thousand rupees, or with both.

Himachal Pradesh Fisheries Rules, 1979 and Himachal Pradesh Fisheries (Fourth Amendment) Rules: Section 3 (1) mentions that the 'General Waters, Trout Waters and Resources' are declared not being private waters to which all or any of the Rules as according to their respective provisions shall apply. These include: i. Gobind Sagar Reservoir: impoundment formed by Bhakra Dam up to a reservoir level of 1680 feet in Bilaspur, Una and Mandi districts of Himachal Pradesh; ii. Pong Reservoir: Impoundment formed by Pong Dam up to a reservoir level of 1410 feet in Kangra district of Himachal Pradesh; iii. Pandoh Reservoir: Impoundment formed by Pandoh Dam on River Beas up to a reservoir level of 2940 feet in Mandi district; iv. Chamera Reservoir: Impoundment Formed By Chamera Dam Up to a reservoir level of 763.16 metres In Chamba district of Himachal Pradesh; v. Ranjeet Sagar Reservoir: Impoundment formed by Ranjeet Sagar Dam (Thein Dam) in the Area falling in Chamba district of Himachal Pradesh.

Part V prohibits fishing by gun, spear, bow arrow or like instruments or pollution of water by trade affluent. Part VI prohibits fishing etc. in prescribed season and or specified waters.

***Panchayats* (Extension to the Scheduled Areas) Act, 1996 No. 40 of 1996 (24th December, 1996):** It's an Act to provide for the extension of the provisions of Part IX of the Constitution relating to the *Panchayats* to the Scheduled Area.

Himachal Pradesh *Panchayati Raj* (Extension to the Scheduled Areas) Rules, 2011: The provisions of these Rules apply to the *Gram Panchayats*, *Panchayat Samitis* and *Zila Parishads* constituted in the Scheduled Areas of the State.

Other Sub-Programmes / Strategies

Integrated Watershed Management Programme (IWMP)

The new 'Common Guidelines' have been notified by the Government of India on 12-03-2008 and National Rain-fed Area Authority (NRAA) has been constituted to oversee the implementation of Watershed Management Programmes in different sectors with a complete change in the approach. The new common guidelines emphasise on the following aspects:

- Set up an Institutional framework at National level (National Rain-fed Area Authority & Central Level Nodal Agency);
- State level (State level Nodal Agency) and District level (District Watershed Development Units) have been devised to coordinate and oversee the implementation of the Integrated Watershed Management Programme (IWMP);
- Given priority to participation and sustainable livelihood;
- Emphasised on engaging professionals for smooth implementation of Watershed Management Programme;
- Traditional Ridge to Valley approach of watershed management has been reoriented in favour of a more flexible framework.

Under Integrated Watershed Management Programme (IWMP), the cropping systems will be improved through promotion of new agronomic practices adoption, crop diversification into high-value crops, reducing post-harvest losses, and increasing value-addition. It will also improve water availability in the project area by using and evolving water harvesting technologies and promoting optimal use of available sources. Activities, such as land

development, introduction of improved cropping system, introduction of high-value crops/varieties, improved cropping systems (horticulture), homestead horticulture and high yielding cultivars will be introduced in the watershed areas. Agriculture will continue to remain the main source of income for the community in the project area. Support will be provided for the traditional crops as well as the High Value Crops (HVCs).

Under Integrated Watershed Management Programme, the focus will be on: (i) disseminating technologies and providing advisory services; (ii) producing and distributing quality seeds and seedlings; and (iii) establishing linkages between farmers and suppliers for processing and marketing of high value crops. Farmers will be directly involved in identifying problems, establishing priorities, and on-farm testing of technologies to enhance productivity. The major emphasis will be on the introduction of off-season vegetables and high value crops. In order to cover a part of the risk, the project will support all the inputs (seeds, seedlings, bio-agents and bio-fertilisers) of the sub-projects, with the condition that the land, labour, irrigation and farm yard manure will be provided by the farmers. In order to facilitate the production of marketable produce, the plan would undertake programmes that demonstrate improvements in the productivity of crops already cultivated in the area and introduction of new high value crops (new varieties of off-season vegetables, fruit crops, medicinal and aromatic plants will be introduced based on agro-climatic factors, demand and assured market). Training will also be provided in application of new technologies, training of para vets and storage techniques etc. These efforts will help in increasing resource conservation and will reduce waste generation.

A number of species, mostly important herbs of mid hills and particularly high hills, require special attention for conserving them. These species are threatened primarily due to habitat degradation, weed Invasions and over exploitation (rampant extraction), as these are sources of livelihoods for poor.

State level Nodal agency (SLNA)

The State level Nodal agency under the chairperson of the Chief Secretary, Himachal Pradesh, has been constituted and the Secretaries, Head of Departments of Agriculture, Horticulture, Animal Husbandry Fisheries, Forest and Rural Development Department etc. have been nominated as members. The salary expenses of the staff of SLNA will be borne by the Government of India. Functions of SLNA are as under:

- Preparation of perspective and strategic plan;
- Establish and maintain a State level data cell and connect it online with national level data centre;
- Technical support to District Watershed Development Unit (DWDU);
- Approve the list of independent institutions for capacity building of stakeholders within the State and workout overall capacity building strategy in consultation with NRAA/Nodal Ministry;
- Approve Project Implementing Agencies (PIAs) identified/selected by DWDU/District Level Committee;
- Establish monitoring, evaluation and learning systems at various levels;
- Constitute a panel of Independent Institutional Evaluators for all watershed projects;
- Prepare State specific process guidelines, technology manuals etc.

Watershed Cell cum Data Centre (DWCDC) in the DRDAs

At the district level, separate Watershed Cell-cum-Data Centres (WCDC) are being created in the DRDAs. The Assistant Project Officers (Watershed) in DRDAs have been authorised to function as Technical Expert in Watershed Cell-cum-Data Centre and their salary expenses would be borne out of the released funds for DWCDC. The functions of the Watershed Cell-cum-data Centres are as under:

- Identification of PIAs;
- Preparation of Strategic and Annual Action Plans for watershed development projects in respective districts;
- Providing professional and technical support to PIAs in planning and execution of water development projects;
- Development of action plan for capacity building with close involvement of resource organisations;
- Carrying out regular monitoring, evaluation and learning;
- Ensuring smooth flow of funds to watershed development projects;
- Ensuring submission of required documents to SLA/Nodal Agency at the Central level;
- Facilitating the co-ordination of relevant programmes of Agriculture, Horticulture, Rural Development, Animal Husbandry etc. with watershed development projects for enhancement of productivity and livelihoods;
- Integrating watershed development projects/plans into District Plans of the District Planning Committees;
- Establishing and maintaining the District Level Data Cell and link it to the State level and National Level Data Centres.

Perspective and Strategic Plan under IWMP

The Perspective and Strategic Plan under Watershed Management Programme for the State is a pre-requisite document for approval of new projects. The perspective and Strategic Plan for 31,12,472 hectare rain-fed area of the State costing Rs. 4668 *crores* has been prepared and proposed to Government of India during March 2009 after approval of SLNA. Out of total geographical area of the State, the Irrigated, snow-covered, dense forest areas, land put to non-agriculture use and already treated area under IWDP, DPAP and DDP (up to September, 2009) have been excluded and the remaining areas (both Forest and non-Forest lands) have been considered in the perspective and strategic plan. The proposed area would be covered under Integrated Watershed Management Programme during the period of 10-15 years.

Cost Norms: As per New Common Guidelines for Watershed Development Projects, the per hectare cost norms have been revised to Rs. 12,000 for plain areas and Rs. 15,000 for hilly areas. The cost sharing between Centre and State Government is in the ratio of 90:10. The budget components are given in Table 11.

Table 11: Budget Components

S. No.	Components	Provisions (%age)
1.	Administrative Cost	1%
2.	Monitoring	1%
3.	Evaluation	1%
Preparatory phase		
1.	Entry point activities	4%
2.	Institutional and Capacity building	5%
3.	Detailed Project Report	1%
Watershed work phase		
1.	Watershed development works	50%
2.	Livelihood activities	10%
3.	Production system and micro enterprises	13%
Consolidated phase		
1.	Consolidated phase	5%
	Grand total (a+b+c+d)	100%

Sanctioning of New Projects as per Common Guidelines: As per new common guidelines for watershed development projects, the projects costing Rs. 662.20 *crores* have been sanctioned in favour of Himachal Pradesh during 2009-10 and 2010-11 for development of 4,41,483 hectares rain-fed area in all the districts of the State. The sanctioning of new projects to cover the rain-fed areas of the State are expected from Government of India in near future.

Detailed Project Report (DPR): Since livelihood enhancement is an important objective of the programme and separate provisions of funds for Livelihood Enhancement (10 percent) and Micro

enterprises (13 percent) have been kept in the common guidelines and the benefits will be provided as per provisions in the Detailed Project Report (DPR), which is an important document for successful implementation of the project and to assess the impact of the project activities, in project areas. The provision of funds (one percent) for preparation of DPR has also been made in the guidelines. In view of the importance of DPR, reputed organisations, who have applied through Expression of Interest (EOI) and found suitable, have been selected to facilitate in the preparation of DPRs. 14 DPRs have been approved and the process of preparation of DPRs of the remaining projects sanctioned in 1st phase is at the final stage. The drafts DPRs are approved by the *Gram Sabha* and, thereafter, the same are to be approved by the SLNA.

Atal Awaas Yojana (AAY): The scheme is being implemented on the pattern of *Indira Awaas Yojana*. With a view to provide housing facility to rural BPL houseless families, the State Government has launched a Rural Housing Scheme named *Atal Awas Yojana* w.e.f. 01-04-08. Under this scheme, assistance of Rs. 48,500 per beneficiary is being provided to BPL families for the construction of a new house.

The Backward Regions Grant Fund (BRGF): It is designed to redress regional imbalances in development. The fund will provide financial resources for supplementing and converging existing developmental inflows into 250 identified districts, so as to:

1. Bridge critical gaps in local infrastructure and other development requirements that are not being adequately met through existing inflows.
2. Strengthen, to this end, *Panchayat* and Municipality level governance with more appropriate capacity building, to facilitate participatory planning, decision making, implementation and monitoring to reflect local felt needs.
3. Provide professional support to local bodies for planning, implementation and monitoring of their plans.

BRGF is being implemented in Chamba and Sirmaur.

Watershed Development Programme: Government of India launched Watershed Development Programme on watershed approach during the year 1995-96. The main objectives of the programme were to ensure overall development of rural areas, Rain Water Harvesting, employment generation, poverty alleviation, community empowerment and development of human and other economic resources of the rural areas, mitigating the adverse effects of extreme climatic conditions and development of natural resources etc. Under these components, the targets are to treat the land identified under Watershed Development Projects. The main activities are soil moisture conservation, water harvesting, afforestation, pasture development, horticultural/agricultural development etc. Presently, following three programmes are being implemented on watershed approach:

1. Integrated Wastelands Development Programme (IWDP)
2. Drought Prone Area Programme (DPAP)
3. Desert Development Programme (DDP)

Integrated Wastelands Development Programme (IWDP): Integrated Wastelands Development Programme is being implemented in all the districts of the State, except Bilaspur, Una and Lahaul and Spiti. Prior to 1.4.2000, the watershed projects under this programme were being funded 100 percent by the Central Government. The projects sanctioned after 1.4.2000 are being funded @ Rs. 5500/- per hectare by the Government of India and Rs. 500/- per hectare by the State Government. During the year 2003-2004, eight new IWDP projects have been sanctioned and an amount of Rs. 1446.53 *lakhs* has been released to the districts for ongoing as well as newly sanctioned projects.

Drought Prone Area Programme (DPAP): This programme is basically an area development programme and aims at integrated development of natural resources, like land, water, vegetation etc. by taking up watershed development projects. The programme is being implemented in 10 blocks of the State. Up to the year 1998-99, the programme was being funded by Central and State Governments on 50:50 sharing basis, but from 1st April, 1999, the Government of India has changed the funding pattern from 50:50 to 75:25. Under this programme, 318 micro watersheds have been taken up for development in districts Bilaspur, Solan and Una for a period of five years. During the year, 2005-2006, 40 new micro watershed projects have been sanctioned by the Government of India under the programme.

Desert Development Programme (DDP): Under DDP, 420 Micro watersheds have been taken up for the development in district of Lahaul and Spiti and Pooh Block of district Kinnaur. The Government of India has sanctioned 38 new micro watershed projects under this programme during the current financial year (23 micro watersheds for Lahaul and Spiti and 15 Micro watersheds for Kinnaur district).

DRDA Administration: The Government of India has restructured various Centrally sponsored schemes and has stressed the need for qualitative implementation and monitoring of these schemes at grassroots level. Besides, in order to have better results and proper utilisation, DRDAs and State Level Monitoring Cells have been created. For this purpose, the Government of India provides funds in the following manner:

1. For Districts having Blocks less than 6 = Rs. 46.00 *lakhs*
2. For Districts having Blocks up to 10 = Rs. 57.00 *lakhs*
3. For Districts having Blocks more than 10 = Rs. 65.00 *lakhs*

Under DRDA Administration, the expenditure is shared by the Central and State Government on 75:25 sharing pattern**.** It is estimated that an amount of Rs. 2797.00 *lakhs* will be received as Central share.

Indira Awas Yojana: *Indira Awas Yojana* is a Centrally Sponsored scheme. Under this scheme, financial assistance of Rs. 27500/- is being provided for the construction of a house to a BPL family. The criterion of selection of beneficiaries is done in the *Gram Sabha*. The sharing of funds between Centre and State is in the ratio of 75:25. This will be continued during 11th five year plan.

Rajeev Gandhi Awas Yojana: *Rajeev Gandhi Awas Yojana* has been started in the State as new Housing Scheme for poor houseless persons during 2003-04. This scheme is being administered on the basis of the ongoing Centrally Sponsored Scheme, '*Indira Awas Yojana*'. The scale of assistance is exactly equal to *Indira Awas Yojana* and this scheme also covers the beneficiaries living below the poverty line. The selection of beneficiaries under this scheme is also done by the *Gram Sabhas*. This scheme will continue through the 11th Five Year Plan and approximately 34414 BPL households will be provided with housing facilities.

Swaranjayanti Gram Swarozgar Yojana: *Swaranjayanti Gram Swarozgar Yojana* (SGSY) has been launched from the year 1999-2000 as a major poverty alleviation programme in the State. SGSY particularly focuses on the vulnerable groups among the rural poor. This scheme is being implemented by Central and State Governments on 75:25 cost sharing basis.

The Department of Rural Development is implementing various programmes/schemes to assist the BPL families. This Yojana lays emphasis on group approach instead of individual beneficiary approach, which would enable the beneficiaries to start viable projects in a joint manner, which can bring them higher incomes. This approach will also improve the skills of the poor through an in-built training component, up-gradation of technology,

providing adequate backward and forward linkages, availability of adequate infrastructure and better marketing arrangements. There is a dire necessity to explore the possibility of finding small industrial units on the basis of local raw material. At the national level, 15 percent funds have been earmarked under SGSY exclusively for implementing infrastructure development projects to ensure maximum self-employment opportunities to the target group families in the rural areas. But in view of the livelihood enhancement, the SGSY is an important programme under which credit and subsidy is provided to the BPL families for income generation assets. This Yojana is a holistic package covering all aspects of self employment, such as organisation of poor into Self Help Groups (SHGs), training, credit, technology, infrastructure and marketing. The beneficiaries under this scheme are called 'Swarozgaris'. This scheme is a credit-cum-subsidy programme. Subsidy under SGSSY is fixed at 30 percent of the project cost subject to a close monitoring of livelihood programmes, especially of BPL families under maximum limit of Rs. 7500/-. In respect of Scheduled Casts / Scheduled Tribes and disabled persons, subsidy has been fixed at 50 percent or maximum ceiling of Rs. 10,000/-, respectively. For groups of Swarozgaris (SHGs), the subsidy is 50 percent of the project cost, subject to per capita subsidy of Rs. 10,000 or Rs. 1.25 *lakhs,* whichever is less.

Sampoorna Grameen Rozgar Yojana (SGRY): In order to create additional gainful wage employment for the rural people, particularly the weaker sections of the society, employment generation programme '***Sampoorna Grameen Rozgar Yojana'*** is being implemented in the State. The scheme is being implemented on cost sharing basis between Government of India (GoI) and the State Government in the ratio of 75:25 of the cash component. The food grains are free of cost. This scheme focuses on the creation of rural infrastructure for more sustained wage employment and rural development. During the 11th Plan, the estimated amount to be received from the Government of India as its share is Rs. 2160.00 *lakhs* and an amount of Rs. 720.00 *lakhs* is required as State Government's share. Apart from this, an amount of Rs. 99.50 *lakhs* is needed to meet the transportation charges of food grains.

Guru Ravidass Civic Amenities Up-gradation Scheme: This scheme has been launched in the State to provide Civic Amenities, like *pucca* streets drainage and public hydrant, or in the absence of piped water supply, provision of a hand-pump etc. in the villages with the highest concentration of Scheduled Castes population. As per the scheme, a *Gram Panchayat* ward will be selected in each *Vidhan Sabha* Constituency, which has the highest concentration of Scheduled Castes population. The ward will be surveyed for gaps in availability of civic amenities, like pucca streets, drainage and public hydrant, or in the absence of piped water supply, provision of a hand-pump etc. Based on this assessment, in each *Vidhan Sabha* Constituency, an amount of Rs. 5.00 *lakhs* is provided in a year to meet such needs. From the year 2006-07, the allocation under this head has been increased to Rs. 10.00 *lakhs* for each constituency in non-tribal areas of the State. In view of the revised allocation, the estimated requirement of funds during the 11th Five year Plan will be Rs. 3250.00 *lakhs*.

Rural Tourism Infrastructure Development: Under this Scheme, thrust will be on promoting village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions.

Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be on tapping the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/ Departments of the Government of India.

Central Rural Sanitation Programme (Total Sanitation Campaign): The concept of sanitation was earlier limited to disposal of human excreta by cess pools, open ditches, pit latrines, bucket system etc. Today, it connotes a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, and personal, domestic as well as environmental hygiene. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal. The 'Total Sanitation Campaign (TSC)' emphasises more on Information, Education and Communication (IEC), Human Resource Development, Capacity Development activities to increase awareness among the rural people and generation of demand for sanitary facilities.

The main objectives of the Total Sanitation Campaign (TSC) are to bring about an improvement in the general quality of life in the rural areas; accelerate sanitation coverage in rural areas; generate felt demand for sanitation facilities through awareness creation and health education; cover schools / Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students; encourage cost effective and appropriate technologies in sanitation; eliminate open defecation to minimise the risk of contamination of drinking water sources and food; convert dry latrines to pour flush latrines; and eliminate manual scavenging practices, wherever in existence in rural areas.

The implementation of TSC is proposed on a project mode. A project proposal emanating from a district is scrutinised by the State Government and transmitted to the Government of India (Department of Drinking Water Supply, Ministry of Rural Development). TSC is implemented in phases with start-up activities. Funds are made available for preliminary IEC work. The physical implementation gets oriented towards satisfying the felt-needs, wherein individual households choose from a menu of options for their household latrines.

In Himachal Pradesh, all 12 district of the State have been covered under Total Sanitation Campaign and the Government of Himachal Pradesh has launched a comprehensive strategy to tackle the sanitation challenge by promoting full sanitation coverage in rural areas and eliminating the practice of open defecation in the State. The programme is being implemented with an active participation of rural masses and *Panchayati Raj* Institutions. The primacy of awareness in generating a demand for sanitation through IEC is the successful achievement of goals of sanitation. The State of Himachal Pradesh has already developed IEC and technical manuals. These manuals contain information about low cost technology and IEC activities to be taken at different levels. In addition to it, the State has also arranged different workshops on IEC in which large numbers of participants, like members of *Zila Parishad*, *Panchayat* functionaries, NGOs, representatives from Departments like IPH, Health, Education and District Rural Development Agencies have participated.

Convergence of the Total Sanitation Campaign with National Rural Health Mission has also started at State level. At district level, the District Health Mission would guide activities of sanitation at district level and promote joint IEC for public health, sanitation and hygiene through village Health and Sanitation Committee and promote household toilets and school sanitation programme, which will be successfully achieved during the 11th Plan period. Hence, in view of the position explained above, necessary provisions of sufficient outlay for 11th Plan are needed under the scheme and it has been estimated that an amount of Rs. 1200.00 *lakhs* is needed to meet the requirement of State's share.

Rural Tourism Infrastructure Development Scheme: Under this Scheme, thrust is on promoting village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions. Activities like

improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be on tapping the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/Departments of the Government of India.

Rural Water Supply: As on 1st April, 2007, only 1407 Partially Covered habitations were left to be covered with safe drinking water facilities in the State. The proposed outlay for Eleventh Five Year Plan (2007-12) has been kept at Rs. 72616.00 *lakhs* with a target to cover 3000 habitations under State sector.

There are district level programmes, like *Vikas Mein Jan Sahayog* (people's contribution towards development) in which communities or individuals contribute about 25 percent of the amount for infrastructure development and the rest is contributed by the Government.

The Government has made it mandatory to construct Rain Water Harvesting systems in all the buildings in the State. The Government is implementing various watershed schemes through its development Departments with the involvement of the PRIs and thecommunity.

***Mahila Mandal Protsahan Yojana*:** With the objective of encouraging the involvement of *Mahila Mandals* in development programmes, the Department has introduced a scheme titled *Mahila Mandal Protsahan Yojana* from the year 1998-99, which aims at creating awareness of various developmental programmes among the people through the *Mahila Mandals* and encouraging their involvement in development programmes. Besides, it aims at generating awareness among the rural woman about family planning and child care, promotion of small savings, participation in literacy/post literacy campaigns and educating them about social evils, like drinking, dowry and crimes against women. The funds under this scheme are being provided to only registered *Mahila Mandals* on the basis of their performance in various developmental activities. The incentive money sanctioned under this scheme is utilised for the creation of community assets, purchase of utensils, dairies, furniture, musical instruments, and organisation of cultural activities/awareness camps and conducting of study tours within the State.

National Rural Employment Guarantee Scheme (Mahatma Gandhi National Rural Employment Guarantee Act): The National Rural Employment Guarantee Act was notified by the Government of India on September, 2005 and was made effective with effect from (w.e.f.) 2nd February 2006. The focus of the scheme is on the following works in their order of priority: Water conservation and water harvesting works; drought proofing works (including afforestation and tree plantation); irrigation canals including micro and minor irrigation works; provision of irrigation facility, horticulture plantation and land development facilities on land owned by households belonging to the Scheduled Castes and Scheduled Tribes or Below Poverty Line families or beneficiaries of land reforms or the beneficiaries under the *Indira Awas Yojana* of the Government of India; renovation of traditional water bodies including desilting of tanks; land developments works; flood control and protection works including drainage in water logged areas; rural connectivity to provide all-weather access. In Himachal Pradesh, initially Chamba and Sirmaur districts were covered under this scheme. The districts of Mandi and Kangra were also covered under the scheme w.e.f. 1.4.2007. From 1.4.2008, all districts of the State have been covered under this programme.

The Eleventh Plan envisages the implementation of the National Rural Employment Guarantee Act in all the twelve districts of the State with effect from 1st April, 2008. The programme is aimed at providing income transfer to the poor in the times when no employment opportunities are available to them. The programme further aims at creating durable assets and strengthening the livelihood

resource base of the poor. The Eleventh Plan also stresses upon building linkages between the NREGA and other Government run programmes to ensure basic human entitlements to the workers by providing wage employment under various programmes and strengthening of the natural resource base for long term sustainability of the livelihood strategies.

Till September 2010, about 422 works have been completed, while 12310 works are in progress in the area of water conservation. In the area of establishing water harvesting structures, about 234 works have been completed and 3842 are in progress for renovation of traditional water bodies; 16 works have been completed and 751 are in progress for drought proofing; 218 works have been completed and 9650 works are in progress in the area of irrigation canals; 70 works have been completed and 118 works are in progress for providing irrigation facilities to SC/ST/IAY/LY; and 367 works have been completed, while 6840 works are in progress for land development.

National Lake Conservation Plan (NLCP), 2001: Recognising the importance of lakes, the Ministry of Environment and Forests, Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The scheme was approved by the Government of India during the IX Plan (June 2001) as 100 percent Central grant. Funding pattern under NLCP has since been changed, w.e.f. February, 2002, from 100 percent Central funding to 70:30 costs sharing between the Central and the concerned State Government.

The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country, which were degraded due to waste water discharge into the lake, and other unique freshwater ecosystems through an integrated ecosystem approach. Unique fresh water ecosystems cover lakes that are unique entities of incomparable values and need to be preserved and conserved, e.g., high altitude lakes etc.

Hand pump Installation programme: Drinking water facilities are also being provided through the important programme of hand pumps installation at location of priority in drought prone/acute water scarcity areas. However, the programme is generally supplementing the existing piped water supply schemes in drought prone/water scarcity areas due to limitations because the hand pumps are being installed along road side locations.

There are district level programmes, like *Vikas Mein Jan Sahayog* (people's contribution towards development) in which communities or individuals contribute about 25 percent of the amount for infrastructure development and the rest is contributed by the Government.

Special Component Plan (SCP) Renamed as Scheduled Castes Sub Plan (SCSP) for the Scheduled Castes: The Government has formulated a Special Component Plan (SCP), renamed as Scheduled Castes Sub Plan (SCSP), for the Scheduled Castes as part of the State Plan. The SCSP is designed to channelise the flow of benefits and outlays from the general sectors in the State plan and from the Union Ministry of Social Justice and Empowerment for the development of Scheduled Castes in physical and financial terms. The Scheduled Castes Sub Plan is designed to help poor SC families through composite income generating programmes. In addition, this Sub-Plan seeks to improve the living conditions of SCs through provision of drinking water supply, link roads, house-sites, establishment of educational, health, veterinary institutions etc. This Sub-Plan process includes identification; formulation and implementation of schemes/programmes under different sectors for the economic amelioration of the persons belonging to these communities. Outlays were specifically earmarked in the State Plan besides supplementation by the Ministry of Social Justice and Empowerment, Government of

India by way of Special Central Assistance. The Tribal sub-Plan is area-based, whereas SCSP is directly benefiting the individuals/families and creating infrastructural facilities in the *bastis* where Scheduled Caste concentration is 50 percent or more.

District Planning Cells: The District Planning Cells are engaged in the preparation of shelf of schemes at the decentralised level, to monitor the process of the implementation of all the plan schemes being run by various Departments soon after the approval of the budget. Besides, the Planning Cells also prepare the shelf of schemes under decentralised planning programmes VMJS, Sectoral Decentralised Planning and the Backward Area Sub-Plan. The Planning Cells play a pivotal role in reviewing the implementation of MPLAD and *Vidhayak Keshetra Nidhi Yojana* by convening the meeting of District Planning, Development and 20-Point Review Committees. In these meetings, the pace of expenditure and the level of development achieved through implementation of schemes are reviewed. Thereafter, the DCs and other Executing Agencies ensure taking up corrective measure from time to time. In addition to these activities, these units are engaged in the collection of data, desired by the State Government and District Administration concerned with developmental activities and for the evaluation of schemes.

Local District Planning: The scheme was first introduced in the year 1984-85 to provide space for planning and implementation at the sub-state level. From the year 1999-2000, this scheme was discontinued and a new programme called *Vidhayak Kshetra Vikas Nidhi Yojana* (VKVNY) was launched.

***Vidhayak Kshetra Vikas Nidhi Yojana* (VKVNY):** Towards strengthening of decentralisation process and for ensuring more active involvement of the elected representatives in addressing the micro-level issues of development, the State Government started a new scheme, *Vidhayak Kshetra Vikas Nidhi Yojana*, during the year 1999-2000. The scheme envisaged allocation of Rs. 15.00 *lakhs* per MLA for taking up developmental schemes/works against the most felt needs of the area in his constituency. The implementation of this programme ensures balanced development of all the areas in Himachal Pradesh irrespective of political affiliation and all elected MLAs also got equal treatment. The scheme was discontinued in the year 2001-02 .The State Government resumed this scheme from the Annual Plan (2003-04).

The Rural Infrastructure Development Fund (RIDF): It was introduced by the Government of India with the basic objective of extending loan assistance to the State Governments through NABARD for the completion of ongoing schemes and also the new projects in the infrastructure sector of the economy. This loan assistance is part of the plan financing of the annual plan of the State Governments at concessional interest rates. This programme was re-named as Agriculture Infrastructure and Credit Fund (AICF) during the year 2004-05. Under the Agriculture Infrastructure and Credit Fund (AICF), Rural Roads and Rural Water Supply schemes were not eligible for funding through the NABARD assistance. This programme was restored to its original form during 2004-05 (8th July, 2004). The State Government has been availing the NABARD's Loan Assistance for the construction of Rural Road and Bridges, Minor Irrigation Schemes, Flood Protection Works, School Buildings, Drinking Water Supply Schemes, establishment of Information Centres and establishment of IT Project.

Sectoral Decentralised Planning Programme in Himachal Pradesh: Sectoral Decentralised Planning (SDP) was introduced in 1993 in all the districts, except Tribal Areas of the Pradesh, pursuant to the recommendations of DCs Conference in 1993. Under this programme, five percent of the approved outlays in selected heads of development are taken out and, thereafter, allocated to the districts (non-tribal areas) on the same formula as for the local district Planning, i.e., 60 percent on the basis of

population and 40 percent on the basis of geographical area. Funds thus pooled are placed at the disposal of districts as 'Untied Funds' to be utilised for the redressal of such public grievances relating to works of small nature involving small financial implications as emerges in the district level 'Public Grievances Redressal Committees' meetings.

The districts are given total freedom for identifying projects to be implemented under this programme. The guiding principle was that the schemes should be in the nature of meeting critical gaps or missing links and should also enhance the credibility of the grievances redressal machinery. Only constraint applied is that no diversions are allowed from earmarked outlays from rural water supply head of development. The DC is required to get works approved from the District Planning Development and 20-Point Programme Review Committee. The basic thought behind this measure was that, as and when District Level Public Grievances Redressal Committees meet, they are faced with minor developmental grievances, which do not find place in the budget and, at the same time, are so small in financial implications that these could be instantly met to enhance satisfaction level of people through public grievances redressal machinery.

Sectoral Decentralised Planning–Revised Guidelines, 2004: Sectoral Decentralised Planning programme has been observed to be generally useful, as the district administration has been able to meet/redress the grievances of small nature. However, clarifications are sought by the districts on certain points, which come-up during the course of implementation of this programme and necessary clarifications accordingly are issued by the Planning Department. Keeping in view the experience gained/clarifications issued under SDP from time to time, the need for compilation of detailed guidelines containing various clarifications already issued under this programme was felt. As per the decision of the Government, SDP Revised Guidelines, 2004 serves as a handy tool for the process of implementation.

***Rashtriya Sam Vikas Yojana*:** The main objectives of the scheme are to address the problems of low agricultural productivity, unemployment and to fill in critical gaps in physical and social infrastructure and to reduce the inequalities in the levels of development. Therefore, it has become imperative to bring about a sustainable increase in both economic growth and incomes of the regions that are lagging behind and also reduce poverty and unemployment. Pursuant to this, the Planning Commission, Government of India has introduced a new scheme 'Rashtriya Sam Vikas Yojana' in 132 identified backward districts of the country. The Planning Commission had identified two districts, namely Chamba and Sirmaur of Himachal Pradesh on the basis of their incidence of poverty and level of other Socio-Economic indicators. The Planning Commission, Government of India has approved to cover both these districts under RSVY on the recommendation of the State Government. Districts Chamba and Sirmaur have been included under RSVY from the financial year, i.e., 2003-04 and 2004-05, respectively. Planning Commission will provide an ACA of Rs. 15.00 *crores* for each district per annum for a total period of three years. District Plan is required to be submitted to the Planning Commission after the approval of State Level Steering Committee (SLSC) and the Planning Commission would release the funds after the Draft District Plan is received and approved by the Planning Commission.

Vikas Mein Jan Sahyog (VMJS): The State Government has started a programme named *Gaon Bhi Apna aur Kam Bhi Apna* in the year 1991-92 as a step in the area of decentralised planning and public participation. A detailed review of this scheme was carried out after two years of its implementation, which led to the restructuring and renaming of the programme as 'Vikas Main Jan Sahyog'. Basic approach behind this programme is to ensure people's participation at the grassroots level with an objective of supplementing the Government

efforts in the area of infrastructural development and ensure the sustainability of assets in future. VMJS has provisions for the construction of school buildings, multipurpose community assets, motorable roads and rope-ways, irrigation schemes/drinking water schemes/installation of hand pumps, buildings for public health services, provision of important missing links, such as three phase transmission lines, transformers, X-Ray plants and ambulances etc.

There is people's participation from the stage of identification of the scheme based on local priorities up to the level of its execution as is clear from the very nomenclature of the Scheme. According to the guidelines of the scheme, a community or an individual can approach the DC/ADC/ADM/SDM/DPO/BDO for taking up a particular work under this scheme and thereafter the community or an individual can submit the approved plan along with the requisite contribution and other necessary documents required as per the guidelines of the scheme. People's contribution varies according to the nature/type of scheme and its location, i.e., whether in the urban area, rural area, backward area or SC/ST population predominant area.

VMJS Programme is in operation in the entire State, both in tribal areas as well as non-tribal areas. As per the norms, funds are apportioned among the districts, 60 percent on the basis of population and 40 percent on the basis of area. Schemes sanctioned above Rupees five *lakhs* are over and above the normal financial allocations made to the districts.

Member of Parliament Local Area Development Scheme (MPLADS): Members of Parliament are approached by their Constituents, quite often, for small works of capital nature to be done in their Constituencies. Hence, there was a demand made by MPs that they should be able to recommend works to be done in their Constituencies. Considering these suggestions, the Prime Minister announced in Parliament on 23rd December, 1993, the 'Member of Parliament Local Area Development Scheme'. Detailed guidelines on the Scheme concept, implementation and monitoring of MPLADS were subsequently issued by the Ministry of Rural Development in February, 1994 that initially handled the Scheme. The guidelines were revised in December, 1994 by this Ministry. Pursuant to these guidelines, the Ministry issued Circulars, from time to time, on matters relating to operational details, based on suggestions received from Members of Parliament and others. Revised Guidelines were issued in February, 1997 and September, 1999. Thereafter, amendments to some provisions of the guidelines were issued from time to time. These guidelines are issued after incorporating amendments. Under this scheme, each MP will have the choice to suggest to the Head of the District, works to the tune of Rs. One *Crore* per year, to be taken up in his/her constituency. Elected Members of Rajya Sabha, representing the whole of the State as they do, may select works for implementation in one or more district(s) as they may choose. Nominated Members of the Lok Sabha and Rajya Sabha may also select works for implementation in one or more districts, anywhere in the country. The allocation per MP per year stands increased to Rs. Two *Crores* from the year 1998-1999.

MPs can also recommend works outside their constituencies/States for construction of assets that are permissible in the guidelines, for rehabilitation measures in the event of 'natural calamity of rare severity' in any part of the country for an amount not exceeding Rs. 10 *lakhs*, for each calamity.

This scheme has been introduced for implementation as a Central Sector Scheme from the year 1993-94. The objective of the scheme is to authorise MPs to recommend small works of capital nature demanded by their Constituents. Un der this scheme, each MP has the choice to suggest to District Collector works to the tune of Rs. 1.00 *crore* per year from the financial year 1994-95 (whereas for the year 1993-94, each MP could suggest works to the tune of Rs. Five *Lakhs* to

be taken up in their respective Constituencies) with each individual work not exceeding Rs. 10.00 *lakhs*. During the year 1998-99, the Government of India has raised the allocation under MPLADS from Rs. 1.00 *crore* to Rs. 2.00 *crores* per MP per year. The Planning Department has been declared the nodal agency for implementation of this scheme and it coordinates the implementation of this scheme with the help of the concerned DCs. The illustrative list of works that can be taken up under the scheme are construction of school buildings; providing drinking water to the people in the villages, towns or cities by digging tube wells or other works, which may help in this respect; construction of village roads or approach roads; construction of bridges on the approach roads; construction of common shelters for the old or handicapped; construction of buildings for local bodies or for cultural and sports activities or for hospitals, social forestry, farm forestry, horticulture, parks and gardens in Government and community land; desilting of village ponds; construction of irrigation canals; construction of common gobar-gas plants, non conventional energy system/devices for community use and related activities; construction of small irrigation *bandhs* or lift irrigation schemes or water table recharging schemes; public reading rooms or study rooms, crèches and Anganwadies; construction of public health care buildings including family welfare Sub-centres together with ANM's residential buildings; crematorium/burial grounds; construction of public toilets and bathrooms, drains and gutters, footpath, path-ways and foot bridges; provision of civic amenities like electricity, water, pathways, public toilets etc. in slum areas of cities, towns and villages; provision of common work sheds in slums and for artisans; residential schools in tribal areas; Bus-sheds/stops for passengers using public transport; Veterinary-Aid Centres etc.

Mukhya Mantri Gram Path Yojana: During the year 2002-2003, a new scheme called the *Mukhya Mantri Gram Path Yojana* was started in Himachal Pradesh, which aims at providing connectivity to villages from nearby motorable roads. Allocation of funds to the districts is made on the basis of total rural population and total number of inhabited villages in the district on 50:50 ratio as per the 1991 Census. Under the programme, neither recurring expenditure/liability can be created nor is the construction of *kuccha* path allowed. Under this scheme, only *Kuccha* Paths in rural areas would be made mettled besi des having a provision for the construction of small culverts/bridges, which, otherwise, may be necessary for providing smooth and all weather connectivity to the people residing in far flung areas. The programme content has further been enhanced from 2003-04 by linking this scheme with Food for Work programme.

Backward Area Sub Plan: The most backward pockets in India had not been receiving adequate attention through the general process of deve lopment. It is in this context that the need for specific mechanisms to take care of developmental backlog of such areas was felt towards the end of the Fourth Plan. The evolution of a sub-plan concept manifested itself as the tribal sub-plan across the country during the Fifth Plan. Even beyond this, it was realised that disparities in the level of development persisted in areas outside the Tribal Sub Plan and such areas were not tribal areas by design of the Constitution of India. Redressal of such micro-level disparities was, perhaps, attempted in Himachal Pradesh during the seventies. To begin with, such micro level pockets constituted very small areas with extreme economic backwardness with near total absence of basic developmental infrastructure. Hence, this necessity gave birth to the formulation of the Backward Area Sub Plan, which was designed to look after the developmental needs at the micro level for these identified areas. After the introduction of the Tribal Sub-Plan in Himachal Pradesh in the beginning of Fifth Five Year Plan, the most backward pockets outside the tribal belt started receiving special attention towards the development of backward areas. The objectives of BASP are to reduce regional disparities; evolve suitable policy for the

development of backward areas; decentralisation of the planning process; ensure people's participation in planning and decision making; providing better coordination and integration of development programmes; effective mobilisation of resources at district level; reduce communication gap between the people and the Government; more powers to the people at local level; and evolving effective decision making system at the district level.

The basic criteria decided for this purpose was remoteness, inaccessibility, coupled with visual perception of the level of socio-economic development and infrastructure backwardness. A total number of 489 *Gram Panchayats* out of 3037 *Panchayats* in the State have been declared as Backward *Panchayats* in Himachal Pradesh.

Border Area Development Programme (BADP): BADP was extended to Himachal Pradesh during 1998-99 by the Government of India (GOI). The objectives of the BADP are to meet the special needs of the Border Area People and to fill up the critical gaps in their development. The criteria for funding are length of International Border, population of Border Blocks and area of Border Blocks. BADP is a 100 percent Centrally funded programme. The Planning Commission, Government of India provides SCA under this programme (within the approved outlays), additional SCA over and above the normal. State share of BADP is also received from GoI, and the scheme is implemented through Tribal Development Department of Himachal Pradesh. Kalpa and Pooh Blocks of Kinnaur and Spiti Block of Lahaul and Spiti districts are covered under BADP.

District Plans in the Eleventh Five Year Plan: The Eleventh Five year Plan (2007-12) lays considerable emphasis on the formulation of district plans from the *Panchayat* level based on participatory approach, which need to get approved from the District Planning Committee (DPC) as per recommendations of the expert group on planning at grassroots level. As a first step, Himachal Pradesh has constituted the District Planning Committees in all the districts. The *Panchayati Raj* Department has been entrusted with the function of the preparation of District Plans by involving all the Deputy Commissioners and the District Planning units in this exercise.

GTZ Project for Micro Planning at *Panchayat* Level: Under this project, 85 percent of the total cost will be received as external assistance and 15 percent will be borne by the State Government as State share. The main objectives of the project are:

1. Preparation of Model Guidelines/Manuals to facilitate the preparation of the best Micro Plans by the *Panchayats*;

2. Constitution of core group of experts for monitoring and advocacy regarding Micro Planning;

3. Study/exposure visits of core group members and selected office bearers of *Gram Panchayats* outside the State and within the State and Capacity building.

Manual on devolution of Powers, functions and responsibilities released by the Department of *Panchayati Raj* vide Notification No. PCH-HA (1) 12/87-10206-406, Dated Shimla-2, July 31, 1996: The manual in exercise of powers conferred under Section 11(2), 83(1) and 94(1) of Himachal Pradesh *Panchayati Raj* Act, 1994 (4 of 1994), the manual gives details about the powers, functions and responsibilities of the Panchayati Raj Institutions in Himachal Pradesh related to the 12 concerned Departments.

The Microfinance Bill: The Bill seeks to promote and regulate MFOs (Micro Finance Organisations). The definition of MFOs 'includes' societies, trusts and cooperatives. The Bill designates NABARD as the regulator for the sector. Micro finance services are defined to include credit, life insurance, and general insurance and pension services. While micro credit has been defined as loans not exceeding Rs. 50,000 (Rs. 1, 50, 000 in case of

housing), the other services have not been defined further.

2.10 Urban Planning

The policies and laws applicable and/or related to rural development and planning of the State along with a brief description of their relevance are listed below. Detailed explanations can be acquired from the websites of the relevant Departments and line Ministries, like Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Urban Development (www.urbanindia.nic.in), Department of Town and Country Planning (http://himachal.gov.in/tcp), Department of Urban Development, Himachal Pradesh (http://hpurbandevelopment.nic.in) and other related agencies.

Constitution of India

The directive principles ensure that the State shall strive to promote the welfare of the people by promoting a social order in which social, economic and political justice is informed in all institutions of life. Also, the State shall work towards reducing economic inequality as well as inequalities in status and opportunities, not only among individuals, but also among groups of people residing in different areas or engaged in different vocations.

The most important aim of Planning is to identify a process of development, which will raise living standards and open out to the people new opportunities for a richer and more prosperous life. The basic objectives of planning can be grouped under four heads: modernisation, growth, self reliance and social justice.

There shall be constituted in every State at the district level a District Planning Committee to consolidate the plans prepared by the *Panchayats* and the Municipalities in the district and to prepare a draft development plan for the district as a whole.

Every District Planning Committee shall, in preparing the draft development plan, have regard to: (i) matters of common interest between the *Panchayats* and the Municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation; and (ii) the extent and type of available resources whether financial or otherwise.

The Constitution of India has assigned the subjects pertaining to the urban areas to the State Legislature. In so far as the urban issues are concerned, the legislative powers of the Union are limited only to the subject/areas: Delhi and other Union Territories, Property of the Union, a subject of the State list, which two or more State legislatures authorise Union Parliament to legislate.

Amendment to the Constitution of India

In exercise of these legislative powers, the Parliament of India has enacted the following legislations, which are administrated by the Ministry of Urban Development. Constitution (Seventy-Fourth Amendment) Act, 1992 is a legislation by which the Constitution of India was amended to incorporate a separate Chapter on Urban Local Bodies, which seeks to redefine their role, power, function and finances. The salient features of this Act are: Urban Local Bodies, to be known as Municipal Corporations, Municipal Councils and *Nagar Panchayats,* depending on the population, shall be constituted through universal adult franchise in each notified urban area of the country.

These shall be constituted for a period of five years and if dissolved earlier, an election to reconstitute it shall be completed before the expiration of a period of six months from the date of its dissolution. Not less than one-third of total number of seats in each urban local body shall be reserved for women. The Legislature of a State may, by law, entrust on these bodies such power and authority as may be necessary to enable them to function as

institutions of Local Self Government, including those listed in the Twelfth Schedule.

The Twelfth Schedule of the Constitution has listed the following functions of the Urban Local Bodies, namely, Urban Planning including town planning, regulation of land-use and construction of buildings; planning for economic and social development; roads and bridges; water supply for domestic, industrial and commercial purposes; public health, sanitation, conservancy and solid waste management; fire services; urban forestry, protection of the environment and promotion of ecological aspects; safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded; slum improvement and upgradation; urban poverty alleviation; provision of urban amenities and facilities, such as parks, gardens, playgrounds; promotion of cultural, educational and aesthetic aspects; burials and burial grounds; cremations, cremation grounds and electric crematoriums; cattle pounds; prevention of cruelty to animals; vital statistics including registration of births and deaths; public amenities including street lighting, parking lots, bus stops and public conveniences; regulation of slaughter houses and tanneries etc.

In order to enable the Urban Local Bodies to perform the functions assigned to them, the Legislature of a State shall assign them specific taxes, duties, tolls and levies and authorise them to impose, collect and appropriate the same. Each State shall also constitute a Finance Commission, which shall review the financial position of the Urban Local Bodies and recommend the principles, which should govern the devolution of resources, including grant-in-aid from the Consolidated Fund of the State for these bodies. The superintendence, direction and control of the preparation of electoral rolls for, and the conduct of, all elections to the Urban Local Bodies shall vest in the State Election Commission. In each district, a District Planning Committee shall be constituted to consolidate the plan prepared by the urban and rural local bodies. Similarly, for each metropolitan area, a Metropolitan Planning Committee shall be constituted to prepare a development plan for the metropolitan area as a whole. All the State Governments have either enacted new Municipal Law or amended the existing laws to conform to the Constitution (74th Amendment) Act, 1992. All the States (except Jharkhand and Pondicherry) have conducted the election to the local bodies. All the States (except Arunachal Pradesh) have constituted State Finance Commissions and most of the Commissions have submitted their reports to the State Governments, recommending significant devolution of resources to the Urban Local Bodies. The national Eleventh Finance Commission has also recommended the devolution of Rs. 2000 *crores* as grant-in-aid from the Central Government to the Urban Local Bodies.

The Constitution (74th Amendment) Act, 1992 has transformed the Urban Local Bodies into vibrant self governing institutions. This has ushered in a new era of urban governance and urban management in India.

National Urban Housing and Habitat Policy, 2007: It aims at Urban Planning by i) encouraging State Governments, Urban Local Bodies, Development Authorities to periodically update their Master Plans and Zoning Plans, which should, inter alia, adequately provide for housing and basic services for the urban poor; ii) promoting balanced urban-rural planning by following the Regional Planning Approach, take the whole State / Union Territory as a region, under the Town and Country Planning Acts in the States. iii) planning of Mass Rapid Transit Systems (MRTS) at the city Metropolitan Planning Area and Sub-region levels.

The said policy also aims at affordable housing, increased flow of funds, removing legal, financial and administrative barriers for facilitating access to tenure, land, finance and technology, spatial incentives, increased supply of land, special provision for SC/ST / OBC/Minorities/Disabled; special provision for women; employment generation;

management information system; and healthy environment.

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to the decentralised public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions.

The Policy hoped that the independently stated policies and programmes of the environment related sectors would be smoothly interfaced with the policies and the programmes of the health sector in order to reduce health risks to the citizens and the consequential disease burden.

This Policy welcomes the participation of the Private Sector in all areas of health activities – primary, secondary and tertiary. The Policy recognises the significant contribution made by NGOs and other institutions of the civil society in making available health services to the community. It also emphasises the need to simplify procedures for Government – Civil Society interface in order to enhance the involvement of civil society in public health programmes.

The National Water Policy, 2002: This National level Policy addresses the water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. Policy states about the use of water, water conservation and quantification of water pollution. It states that water allocation priority should broadly be in the order of drinking water, irrigation, hydropower, ecology, agro industries and non-agriculture industries, navigation and other uses.

Section 1.2 states that rivers and underground aquifers often cut across State boundaries. Water, as a resource, is one and indivisible. Therefore, rainfall, river waters, surface ponds and lakes and groundwater are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of project implementation.

Section 14.5 states that necessary legislation is to be made for preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, including hydrometeorology; snow and lake hydrology; surface and groundwater hydrology; assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; soil and material research; economical designs for water resource projects, sedimentation of reservoirs, prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact; and regional equity.

National Electricity Policy, 2005: In compliance with Section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy, 2005. Electricity is an essential requirement for all facets of our life. It has been recognised as a basic human need. It is a critical infrastructure on which the socio-economic development of the country depends. Supply of electricity at reasonable rate to rural India is essential for its overall development. Equally important is availability of reliable and quality power at competitive rates to Indian industry to make it globally competitive and to enable it to exploit the tremendous potential of employment generation. The service sector

has made significant contribution to the growth of our economy. Availability of quality supply of electricity is very crucial to sustained growth of this segment.

Recognising that electricity is one of the key drivers for rapid economic growth and poverty alleviation, the nation has set the target of making electricity available to all households in the next five years. As per Census 2001, about 44 percent of the households do not have access to electricity. Hence, meeting the target of providing universal access to electricity is a daunting task requiring significant addition to capacity generation and expansion of the transmission and distribution network.

The National Electricity Policy aims at achieving the following objectives:

- Access to Electricity - Available for all households in next five years.
- Availability of Power - Demand to be fully met by 2012. Energy and peaking shortages to be overcome and adequate spinning reserves to be available.
- Supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates.
- Per capita availability of electricity to be increased to over 1000 units by 2012.
- Minimum lifeline consumption of one unit/household/day as a merit good by year 2012.
- Financial turnaround and commercial viability of electricity sector.
- Protection of consumers' interests.

The Policy seeks to address issues, like generation, transmission and distribution; recovery of cost of services and targeted subsidies; technology development and Research and Development (R&D); competition aimed at consumer benefits; financing power sector programmes including Private Sector participation; energy conservation; environmental issues; training and human resource development; co-generation and non-conventional energy sources; protection of consumer interests and quality standards etc.

The National Electricity Policy aims at laying down guidelines for accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources; technology available to exploit these resources; economics of generation using different resources and energy security issues.

The key development objective of the power sector is supply of electricity to all areas including rural areas as mandated in Section 6 of Part II of the Electricity Act, 2003. Both the Central and State Governments would jointly endeavour to achieve this objective at the earliest. Consumers, particularly those who are ready to pay a tariff, which reflects efficient costs, have the right to get uninterrupted twenty four hours supply of quality power.

National Urban Transport Policy (NUTS, undated): The vision of NUTS is to recognise that people occupy centre-stage in our cities and all plans would be for their common benefit and well being; to make our cities the most livable in the world and enable them to become the 'engines of economic growth' that power India's development in the 21st Century; to allow our cities to evolve into an urban form that is best suited for the unique geography of their locations and is best placed to support the main social and economic activities that take place in the city.

The objective of this Policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities. This is sought to be achieved by incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement; encouraging integrated land use and transport planning in all cities so that travel distances are minimised and

access to livelihoods, education, and other social needs, especially for the marginal segments of the urban population, is improved; improving access of business to markets and various factors of production; bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus; encouraging greater use of public transport and non-motorised modes by offering Central financial assistance for this purpose; enabling the establishment of quality focused multi-modal public transport systems that are well integrated; providing seamless travel across modes; establishing effective regulatory and enforcement mechanisms that allow a level playing field for all operators of transport services and enhanced safety for the transport system users; establishing institutional mechanisms for enhanced coordination in the planning and management of transport systems; introducing Intelligent Transport Systems for traffic management; addressing concerns of road safety and trauma response; reducing pollution levels through changes in travelling practices, better enforcement, stricter norms, technological improvements etc.; building capacity (institutional and manpower) to plan for sustainable urban transport and establishing knowledge management system that would service the needs of all urban transport professionals, such as planners, researchers, teachers, students etc.; promoting the use of cleaner technologies; raising finances through innovative mechanisms that tap land as a resource for investments in urban transport infrastructure; associating the Private Sector in activities where their strengths can be beneficially tapped; and taking up pilot projects that demonstrate the potential of possible best practices in sustainable urban transport

The Policy is based on multi-pronged approach that would revolve around the measures highlighted in the previous section. These approaches are Integrating land use and transport planning, equitable allocation of road space, priority to the use of public transport, quality and pricing of public transport, technologies for public transport, integrated public transport systems, financing, role of para-transit, priority to non-motorised transport, parking, freight traffic, legal and administrative issues, capacity building, use of cleaner technologies, innovative financing mechanisms using land as a resource, association of the Private Sector etc.

The National Environment Policy (NEP), 2006: Sustainable development concerns in the sense of enhancement of human well-being, broadly conceived, are a recurring theme in India's development philosophy. The National Environment Policy is intended to mainstream environmental concerns in all development activities.

The dominant theme of this policy is that while conservation of environmental resources is necessary to secure livelihoods and well-being of all, the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation rather than from degradation of the resources.

Objectives of the National Environment Policy include: i. Conservation of Critical Environmental Resources; ii. Intra-generational Equity: Livelihood Security for the Poor; iii. Inter-generational Equity; iv. Integration of Environmental Concerns in Economic and Social Development; v. Efficiency in Environmental Resource Use; vi. Environmental Governance; and vii. Enhancement of Resources for Environmental Conservation.

The Principles of Environment Policy include: Human beings are at the centre of sustainable development concerns; the right to development; environmental protection is an integral part of the development process; the precautionary approach; economic efficiency; polluter pays; entities with 'incomparable' values; equity.

It states that action plans would need to be prepared on identified themes by the concerned agencies at all levels of Government - Central, State/Union

Territories, and Local. These include: Enhancing and conserving environmental resources; environmental standards, management systems, certification and indicators; clean technologies and innovation; environmental awareness, education, and information; partnership and stakeholder involvement; capacity building; research and development; international cooperation; review of the policy; review of implementation.

National Conservation Strategy and Policy Statement on Environment and Development, 1992: The national conservation strategy and the policy statement on environment and development are in response to the need for laying down guidelines that will help to weave environmental considerations into the fabric of national life and of development process. It is an expression of commitment for reorienting policies and action in unison with the environmental perspective.
Wetlands are referred to notably in Section 2.7 of the statement, "Our unique wetlands, rich in aquatic and bird life, providing food and shelter as also the breeding and spawning ground for the marine and fresh water fishes, are facing problems of pollution and over-exploitation."

Section 3.4 on Conservation of Forests and Wildlife refers to "Management Plans for identified wetlands, mangrove areas and coral reefs."

Section 4.0 on constraints and agenda for action states about action. The agenda for action in this regard will include the following: to conserve and nurture the biological diversity, gene pool and other resources through environmentally sustainable development and management of ecosystems, with special emphasis on our mountains, marine and coastal areas, deserts, wetlands, riverine and island ecosystems.
Section 5.2 on Conservation of Natural Resources describes conservation of wetlands for ensuring sustainable ecological and economic benefits.

Subsection 5.2.3 mentions about conservation of biodiversity through a network of protected areas including Biosphere Reserves, Marine Reserves, National Parks, Sanctuaries, Gene Conservation Centres, Wetlands, Coral Reefs and other such natural habitats of biodiversity. This should include taxonomic and ecological studies on the flora and fauna with adequate emphasis placed on the lower vertebrate, invertebrate and micro-flora, which are important in contributing to the healthy maintenance of ecosystems.

Notification on Protection and Improvement of Quality of Environment in the Himalayas, 2001: Issued by the Ministry of Environment and Forests under the Environment (Protection) Act, 1986, this notification is meant specifically for environmental protection in the Himalayan States. The activities relate to location planning in urban areas, rainwater harvesting and guidelines for the construction of hill roads.

National Policy on Resettlement and Rehabilitation (R&R), 2007: The provisions of the National R&R Policy, 2007 provide for the basic minimum requirements of people displaced or affected because of project implementation. It stipulates that all projects leading to involuntary displacement of people must address the rehabilitation and resettlement issues comprehensively. The State Governments, Public Sector Undertakings or agencies, and other requiring bodies shall be at liberty to put in place greater benefit levels than those prescribed in the NRRP-2007.

The Policy addresses the need to provide succour to the asset less rural poor, and support the rehabilitation efforts of the resource poor sections, namely small and marginal farmers, Scheduled Castes / Scheduled Tribes and women, who have been displaced. Besides, it seeks to provide a broad canvas for an effective dialogue between the Project Affected Families and the Administration for Resettlement and Rehabilitation to enable timely completion of

the project with a sense of definiteness as regards costs and adequate attention to the needs of the displaced persons. The objectives of the Policy are to: minimise displacement; plan the R&R of Project Affected Families including special needs of tribals and vulnerable sections; provide better standard of living to Project Affected Families; and facilitate harmonious relationship between the Requiring Body and Project Affected Families through mutual cooperation.

National Tourism Policy, 2002: It advocates sustainability as a guiding star of tourism. It states that development and management strategies should be so worked out as to ensure that tourism largely acts as a smokeless industry and its ecological footprints remain as soft as possible. Neither over-exploitation of natural resources should be permitted nor the carrying capacity of the tourist-sites ignored.

It lays greater emphasis on eco-tourism whose parameters should be broader than those of nature tourism alone. It must help in eliminating poverty, ending unemployment, creating new skills, enhancing the status of woman, preserving cultural heritage, encouraging tribal and local crafts, and improving overall environment and facilitating growth of a more just and fair social order.

The Policy states that deep-rooted relationship of tourism and our cultural assets should be fully recognised. It further states that improvements and environmental upgradation of the protected monuments and the areas around them should be considered as a linchpin of the tourism industry.

It recommends that at the institutional level, a framework would have to be evolved, which is Government-led, Private Sector driven and community-welfare oriented. Government has to provide a legislative framework to regulate tourism, trade and industry; ensure safety and security of the tourists; and create basic infrastructure and health-care facilities. The Private Sector has to act as a main spring of the activities and impart dynamism and speed to the process of development as well as conservation.

It states that effective linkages and close coordination should be established with such Departments as Tourism and Civil Aviation, Environment, Forest, Railways, Home etc.

Environment (Protection) Act, 1986: This is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991, has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986 defines the power of the Central Government to take measures to protect and improve the environment, which includes water, air and land and the inter relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The power conferred by the Environment (Protection) Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance - General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

The Water (Prevention and Control of Pollution) Act 1974, (Amended -1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State

Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974 in 1988, as amended, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the Act defines pollution as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as the case may be, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or of aquatic organisms.

Chapter 5 of the Act deals with Prevention and Control of Water Pollution and Power of State Government to restrict the application of the Act to certain areas; power to obtain information; power to take sample of effluents and procedure to be followed; seek reports of the result of analysis on samples taken under Section 21; power of entry and inspection; prohibition on use of stream or well for disposal of polluting matter etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by State Board; appeals; revision; power of State Board to carry out certain works; furnishing of information to State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Water (Prevention and Control of Pollution) Cess Act, 1977, Amended in 1992 and 2003: This Act seeks to provide for the levy and collection of a Cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central and State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

The Air (Prevention and Control of Pollution) Act, 1981(as amended 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

The Public Premises (Eviction of Unauthorised Occupants) Act, 1971, 40 of 1971: Under the said Act, the Public Premises Eviction of Unauthorised Occupants rules were framed in 1971.

The Urban Land (Ceiling and Regulation) Act, 1976 No. 33 of 1976, 17h February, 1976: It is an Act to provide for the imposition of a ceiling on vacant land in urban agglomerations; for the acquisition of such land in excess of the ceiling limit; to regulate the construction of buildings on such land and for matters connected therewith, with a view to preventing the concentration of urban land in the hands of a few persons and speculation and profiteering therein and with a view to bringing about an equitable distribution of land in urban agglomerations to serve the common good.

Urban Land (Ceiling and Regulation) Repeal Act, 1999, No. 15 of 1999, Dated 22nd March, 1999: The Urban Land (Ceiling and Regulation) Act, 1976 hereinafter referred to as

the Principal Act was repealed by the issuance of the said Act.

Environment Impact Assessment (EIA) Notification, September 14, 2006: The EIA Notification makes Environment Impact Assessment study mandatory for only those sewage sector development project having more than 10000 ha of command area. A water supply project does not require prior environment clearance notification as per EIA Notification. However, the potable water requirements and services in Industrial estates/parks/complexes/areas, Export Processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes Building (item 7c) and Construction projects, Townships and Area Development projects (item 8a and 8b) are covered by the said Notification.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal Solid Wastes in terms of the specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes.

Bio-Medical Waste (Management and Handling) Rules, 1998 (as amended in 2003): These Rules apply to all who generate, collect, receive, store, transport, treat, dispose off, or handle bio-medical waste in any form. Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining to or in production or testing of biologicals. Section 4 of these rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.

National Electricity Act, 2003: Electricity Act, 2003 provides an enabling framework for accelerated and more efficient development of the power sector, which, in turn, results in availability of quality supply of electricity to consumers at competitive rates. The salient features of this policy are: access to electricity - available to all households in the next five years; availability of power - demand to be fully met by 2012; energy and peaking shortages to be overcome and adequate spinning reserve to be available; supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates; per capita availability of electricity to be increased to over 1000 units by 2012; minimum lifeline consumption of one unit/household/day as a merit good by year 2012; financial turnaround and commercial viability of electricity sector; protection of consumers' interests. This act mandates concurrence of hydropower projects (R&R) from CEA.

Energy Conservation Act, 2001: According to this Act, the usage of energy should be kept at minimum both at the point of generation as well as at the point of application. These include short term as well as long term measures. The short term measures include: energy conservation, energy audit of government buildings and capacity building amongst departments to take up energy efficiency programmes. The long term measures include: industry specific task forces; notifying more industries as designated consumers; conduct of energy audit amongst notified designated consumers; recording and publication of best practices (sector-wise), development of energy consumption norms and monitoring of compliance with mandated provision by designated consumers.

Wetlands (Conservation and Management) Rules, 2010: Ministry of Environment and Forests notified rules for conservation and

management of wetlands, namely, Wetlands (Conservation and Management) Rules, 2010. The rules set regulatory framework for conservation of wetlands and enlist some of the activities, which are prohibited and others, which need to be regulated. Categorisation of wetlands has also been proposed on the basis of significance of the functions performed and for determining the extent and level of regulation. The Rules have been framed for protected wetlands to set restrictions on activities within wetlands and has made provisions for setting up a Central Wetlands Management Authority. The Rules have defined the process of identification of wetlands under different categories. The rules also identified overlapping provisions and enforcement of regulated activities.

State Level Policies / Regulations

State Water Policy: The said policy states that water, as a resource, is one and indivisible: rainfall, river waters, surface ponds and lakes and groundwater are all part of one system. In Himachal Pradesh, the availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from about 600 mm in Lahaul and Spiti district to around 3200 mm in Dharamshala, district Kangra. However, in spite of heavy rain and snow during the rainy season and winter, the summer months are periods of water scarcity in many areas as the flow in the rivers and *nallahs* is quite low and traditional sources also dry up. Thus, through its Water Policy, the State also has to address the issues of drought management in some areas and flood control in others.

The Policy states about the requirement of clear guidelines with respect to water related projects. Planning and implementation of water related projects has many socio-economic aspects and issues, such as environmental sustainability, resettlement and rehabilitation of project affected people and livestock, public health concerns of water impoundment, dam safety etc.

It states that water resources available to the State should be brought within the category of utilisable resources to the maximum possible extent. Groundwater exploitation for domestic use and irrigation will be promoted wherever feasible and improvising of surface water in pondages for usage during lean periods shall be encouraged.

The Policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub- basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin so that the best possible combination of options can be selected and sustained."

The Policy recommends watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water sources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

The State level Policy deals with the process and quality of drinking water supply and

sanitation means in different areas of the State, mostly in rural sectors. The Policy links water harvesting practices in households and community. It assigns duties and responsibilities to *Panchayati Raj* Institutions (PRIs) and Non Government Organizations in source development and water allocation. It stresses awareness for development of optimal and efficient use of drinking water. Further, the said Policy emphasises on non-conventional methods for augmenting availability of water, such as artificial recharge of groundwater and traditional water conservation practices, like Rain Water Harvesting, including Roof-top Rain Water Harvesting, and the use of such water through dual plumbing systems in all buildings needs to be promoted. Pilot projects will be supported for demonstration effect. Research and development in these areas shall also be supported.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources and to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation; ecology; afforestation/biodiversity/ tourism; agro-industries; hydro-power; non-agro based industries; and navigation and other uses.

Tourism Policy, 2005: This Policy document aims to provide clear directions for the development of tourism in the State. It seeks to harness the fullest potential of the State for development of tourism, which, in turn, can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The major objectives of the Policy are to: (1) establish Himachal Pradesh as a leading tourist destination in the country and abroad; (2) make tourism a prime engine for economic development and prosperity of the State and as a major means for providing employment; (3) encourage a strong and sustainable Private Sector participation in the creation of tourism infrastructure, especially through Public Private Partnerships; (4) promote sustainable tourism, which is not only environmentally compatible, but also leads to economic betterment of the rural people; (5) attract quality tourists and to extend their stay in the State; (6) safeguard the State's natural and manmade heritage; (7) encourage Civil Societies and Non-Governmental Organisations for the promotion and conducting of tourism related activities; and (8) position Himachal Pradesh as a one stop destination for adventure tourism.

The Government proposes to replicate Manali model of collection of green fee from tourists in other major tourist destinations too. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plans would be created and implemented in a time bound manner.

The State Government will take steps to ensure proper hygienic conditions and to prevent the exploitation of tourists on National and State Highways and at tourist places. The Government proposes to classify the *dhabas* situated on the National and State Highways. The classification will be done on the basis of facilities provided, hygienic conditions, quality of the food, availability of toilets, parkings etc.

Revised Policy on Development of Eco-Tourism in Himachal Pradesh, 2005: The Revised Eco-Tourism Policy aims to bring the

wilderness of Himachal closer to the tourists visiting the State and, at the same time, attempts to put in place adequate safeguards and systems leading to the preservation of these natural resources.

The Policy states that ecological and environmental concerns would form an important component of the Tourism Master Plans for popular destinations. Revenues generated would be ploughed back for the maintenance and preservation of the environment. The Department of Forest would constantly evaluate the project and if it is found that Community Based Eco - Tourism (CBET) / Eco - Tourism norms and concepts are not being followed, the project will be terminated forthwith.

HP Forest Sector Policy, 2005: The forest sector Policy introduced a 'Forest Sector Concept' where it encompasses the entire biophysical and environmental components comprising lands and biological resources (i.e., watersheds, wetlands, wildlife) and includes the stakeholders and institutions directly or indirectly dependent on or responsible for the management of these resources for livelihood security and sustenance, conservation and water harvesting. It also emphasises on watershed management.

Policy on Development of New Townships in Himachal Pradesh (undated): The aim of this Policy is planned and eco-friendly development of new townships in Himachal Pradesh, thereby ensuring better quality of life for its inhabitants. This Policy, therefore, outlines the norms and standards for new townships; the guidelines for developing a new township; the guidelines for sale and purchase of property in new townships; and the guidelines for the maintenance of new townships. The said Policy also emphasise on private participation in the development of new townships in Himachal Pradesh.

Transport Policy: The vision of the Transport Policy is "A prosperous Himachal Pradesh with Transport playing a key role in balanced regional development and harnessing the growth potentials of each and every sector of the Himachal Pradesh economy by improving the ability and efficiency of accessing and distributing goods, services and productive capacity with employment opportunities created around the State. The remote and interior parts of the State will be in the focus for augmentation of transportation network."

The Mission of the Policy is to provide mobility with choice, comfort, convenience, frequency, safety and minimal environmental effects. While the top most priority will be accorded to providing access facilities, efforts will be made to provide a range of transport facilities, like buses, cabs, maxi cabs, auto rickshaws and goods carriers with varying range of load capacity and sizes to provide the maximum choice to the consumers and promote competition to maintain cost effectiveness of services. It shall also be the endeavour of the Department to promote alternate modes of transport like water transport and ropeways etc. wherever possible.

Punjab Tenancy Act, 1887 and the Punjab Tenants Security of Tenure Act, 1950: With a view to securing uniformity of tenancy laws in the Pradesh, the provisions of the Punjab Tenancy Act, 1887 were made applicable throughout the Pradesh by the Himachal Pradesh (application of laws) Order, 1948. The provisions of Punjab Tenants security of Tenure Act, 1950 were also enforced in Himachal Pradesh in 1951.

Punjab Tenancy (Himachal Pradesh Amendment) Act, 1952 and the Himachal Pradesh (Tenants) Rights and Restoration Act, 1952: During the year 1952, the Punjab Tenancy (Himachal Pradesh Amendment) Act, 1952 was enacted, which envisaged a ceiling on rent not exceeding $1/4^{th}$ of the produce, payable by the tenant to the landowner. Another act, i.e., Himachal Pradesh Tenancy Rights and (Restoration) Act, 1952 was enacted to provide for restoration of land and the right of pre-emption to tenants. Under Section 3 of

the said Act, the tenant, who has been ejected after 15th of August,1950, shall, on application made by him within two years of the commencement of this Act to the prescribed authority and on his satisfying such authority that the applicant was not, at the time of ejectment, a tenant to whom the provision of Section 41 of Punjab Tenancy Act, as amended in its application to Himachal Pradesh by the Punjab Tenancy (Himachal Pradesh Amendment) Act, 1952, could have applied, be restored the possession of such land on the same terms and conditions on which it was held by him at the time of ejectment. It was provided that the maximum rent payable by him on re-occupation of the land shall be subject to the provision of Section 25 (A) of the Punjab Tenancy Act, 1887 as amended in its application to Himachal Pradesh by the Punjab Tenancy (Himachal Pradesh Amendment) Act, 1952. Further, if the land has been given to another tenant on or after the fifteenth day of August, 1952, he shall be ejected there from and given in lieu of it Nautor land as prescribed.

Himachal Pradesh Abolition of Big Landed Estates and Land Reforms Act, 1953: The first major land reform legislation known as the Himachal Pradesh Abolition of Big Landed Estates and land Reforms Act, 1953 was enacted, which, after receiving the assent of the President came into force on 26th January, 1955. The Act governed the law relating to tenancies in agricultural lands and also contained provisions of land reforms of a far reaching importance. Under the Act, security of tenure to the tenants was ensured. Resumption of land by landowners was permitted for personal cultivation from a maximum area of 5 acres subject to further provision that no tenant would be evicted from more than 1/4th of the area held by him. This right could be exercised within one year from the commencement of the Act. These dates were later extended to March 1st, 1956 and September, 1956. The aforesaid law was challenged by the landowners in the court, which, ultimately resulted in the survival of the law as intra-vires of the Constitution in the year 1958.

Himachal Pradesh (Transferred Territory) Tenants (Protection of Rights) Act, 1968: As a result of re-organisation of Punjab State on November I, 1966, certain areas of erstwhile Punjab were merged in Himachal Pradesh. Immediately, after merger of such areas, the disparity in land laws of the old and merged areas became evident. There were complaints of arbitrary ejectment of tenants from the merged areas. Therefore, the first step to ameliorate the lot of tenants in these areas was that Himachal Pradesh *Vidhan Sabha* passed the Himachal Pradesh (Transferred Territory) Tenants (Protection of Rights) Act, 1968, thereby providing security against ejectment of the tenants in the aforesaid merged areas. The ejectment under the aforesaid Act could be made on grounds similar to those available in the tenancy laws of old areas. This Act was initially valid for a year, but the period was subsequently extended by two years by two successive amendments in 1969 and 1970. In terms of these amendments, the Government was empowered to extend the validity of the Act, if necessary, by way of notification under the 1970 Act. Thereafter, the Government further extended its validity up to November, 1971 by notification.

In the September session of the *Vidhan Sabha* in 1971, the Government further passed the Himachal Pradesh (Transferred Territory) Tenants (Protection of Rights) Act, 1971, whereby it put a blanket ban on ejectment of tenants for one year. This period was further extended for six months by promulgating an ordinance, which was replaced by an amended Act passed by the *Vidhan Sabha* in December, 1972.

Himachal Pradesh Tenancy and Land Reforms Act, 1972: With the commencement of the Act, all the occupancy tenants in the old areas and Kismi tenants in the new areas have become owners of their tenancy lands. The small landowners are entitled to reserve land for personal cultivation up to one and a half

acres of irrigated and three acres of un-irrigated land. The non-occupancy tenants in such affected holdings will simultaneously become owners of the remaining tenancy land. The rest of the non-occupancy tenants (including sub-tenants) will become owners of their tenancy land on payment of nominal compensation of 96 times of the land revenue rates and cesses chargeable thereon. These conferments of compulsory rights of purchase of land by tenants was necessitated, as in spite of the provision in the Himachal Pradesh abolition of big landed estates and land reforms Act, for some reasons or the other, the tenants were not coming forth to apply for ownership. Now, the tenants will not be put to litigation and undergo the ordeal of trial of their cases in the Court of law.

Further, with a view to discouraging speculation in agricultural land, the Act interdicts non-agriculturalists from procuring/purchasing any agricultural land in the Pradesh. In other words, the Act imposes restrictions on transfer of land in favour of those non-agriculturists, who do not cultivate land personally in Himachal Pradesh.

Himachal Pradesh Ceiling on land Holdings Act, 1972: The Act envisages a ceiling on land holdings with a view to controlling concentration of land in a few hands, and to subsequently distribute surplus land released thus, among the landless. The ceiling is for a family of husband, wife and three minor children. Section 4 of the Act puts a ceiling on holdings of land beyond a certain limit as indicated below:

(a) Land under assured irrigation capable of growing two crops in a year - 10 acres; (b) land under assured irrigation capable of growing one crop in a year - 15 acres; (c) Land of classes other than (a) and (b) described above, including land under orchards - 30 acres; (d) A separate higher ceiling has been envisaged in respect of certain areas of Himachal Pradesh as the above yardstick was not considered a judicious preposition in such areas. For instance, a ceiling of 70 acres has been fixed for whole of the districts of Kinnaur and Lahaul-Spiti; Pangi and Bharmaur areas of Chamba districts; and Chhota Bhangal and Bara Bhangal of district Kangra; (e) for instance, every additional minor member to the family can claim 1/5th of the permissible area provided that ceiling does not exceed twice the permissible area; (f) an adult is also entitled to a separate unit subject to the same condition that the permissible area does not exceed twice the limit of fixed bid. Section 5 of the Act provides for certain exemptions, e.g., the land held by State or Central Governments, Registered Co-operative Farming Societies, Land Mortgage Bank, Local Authorities, Himachal Pradesh Agricultural University, *Bhoodan Yojana* Board, and the Tea Estates. The surplus land so vested in the Government was to be distributed among landless agricultural labourers and to those persons, whose holdings do not exceed one acre.

The Himachal Pradesh Motor Vehicles Taxation Act, 1972, (Act No. 4 of 1973): It's an Act to impose tax on motor vehicles in the State of Himachal Pradesh and for other matters connected therewith.

The Himachal Pradesh Ferries Act, 2004: The Act deals with public ferries, licensing and registration, safety and rescue measures, issue of permit, offences and penalties.

The Himachal Pradesh *Panchayati Raj* Act, 1994: This Act seeks to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

The *Gram Sabha* shall perform the functions, which include: (a) mobilise voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identification of beneficiaries for the implementation of developmental schemes pertaining to the village; (c) render assistance in the implementation of developmental schemes pertaining to the village; (d) approve plans,

programmes and budget, prepared by the *Gram Panchayat* for economic development and social justice; and (e) authorise, after being satisfied, issuance of utilisation certificates for funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for their maintenance and repair (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samitis* and *Zila Parishads* located in the scheduled areas. Every *Gram Sabha* shall be responsible for: (i) approving plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat* at the village level; and (ii) identifying or selecting persons as beneficiaries under poverty alleviation and other programmes.

Management of minor water bodies in the scheduled area: Planning and management of minor water bodies in the scheduled areas shall be entrusted to *Gram Panchayats, Panchayat Samitis* or the *Zila Parishads*, as the case may be, in such manner as may be prescribed.

Chapter-XII of this Act deals with the preparation of development plans and District Planning Committee. Preparation of development plans include the following provisions: (1) Every *Panchayat* shall prepare every year a development plan to perform functions specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) every *Panchayat* shall prepare every year, a development plan of schemes for economic development and social justice for their respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the *Zila Parishads*, *Panchayat Samitis*, *Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

The Himachal Pradesh Municipal Corporation Act, 1994, Act No. 12 of 1994 (as assented to by the Governor on 18th October, 1994): It is an Act to consolidate, amend and replace the law relating to the establishment of Municipal Corporations for certain Municipal areas in the State of Himachal Pradesh.

The Himachal Pradesh Municipal Act, 1994, (Act No. 13 of 1994): It is an Act to consolidate and amend and replace the law relating to Municipalities in Himachal Pradesh.

Alienation of Municipal Properties Rules, 1971: According to these Rules (a) 'Committee' means a Municipal Committee or a Notified Area Committee established by or under the Himachal Pradesh Municipal Act, 1968, or a Municipal Corporation established by or under the Capital of Himachal Pradesh (Development and Regulation) Act, 1968. (b) 'Municipality' means Municipal Committee or Notified Area Committee or Municipal Corporation.

Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This Act seeks

to prevent throwing or depositing non-biodegradable garbage in public drains, roads and places open to public view and to regulate the use of non-biodegradable materials in the State. The Act prohibits throwing degradable garbage in public drains and sewage and has provision for placement of receptacles and places for deposit of non-biodegradable garbage. It defines the duty of owners and occupiers to collect and deposit non-biodegradable garbage etc. and defines power of local authority for removal of non-biodegradable garbage. It stresses on studies, research and support programme.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This Act seeks to re-enact a law relating to registration of persons engaged in tourist trade, constitution of the Tourism Development Board and other matters connected therewith. This Act defines functions of Tourist Development Board under Section 8 of Chapter II.

Section 17, Chapter III of the Act states about the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, chapter III states that the function of the Council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spots, environmental upgradation etc.; assist the local body in maintaining sanitation and infrastructure facilities at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities; prepare a Tourism Master Plan for its area; and all tourism units and establishment shall conform to the Master Plan

Tourism Development Council for Shimla and Manali under Himachal Pradesh Tourism Development and Registration Act, 2002: The functions of Tourism Development Council are to provide and maintain tourism related services; assist the local body in maintaining infrastructural facilities at tourist spots; build and maintain tourism and recreational facilities, which may enhance the tourism value of the area; prepare Tourism Master Plan for the area; and maintain and operate a Tourism Destination Fund.

The Council can also raise the resources for development of infrastructure and facilities by way of fees, cess etc. However, Tourism Destination Fund has not been established for Shimla yet. Besides, Tourism Development Council for Manali and Kullu district has also been constituted vide Notification No. tsm F3-2/2003-I dated 7.7.2004.

The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act No. 32, 1976): This Act seeks to provide for the preservation of ancient and historical monuments, archaeological sites and remains other than those of national importance; for the regulation of archaeological excavations; and for the protection of sculptures, carvings and other like objects.

Section 16 of this Act states about the protection of place of worship from misuse, pollution or desecration. A protected monument maintained by the Government under this Act, which is a place of worship or shrine, shall not be used for any purpose inconsistent with its character.

The Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implementing the provisions of the Act, may (a) issue guidelines for adoption of Rain Water Harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural and urban areas; (d) undertake Information, Education and Communication activities including workshops, seminars,

public discourses, debates, radio and television programmes to promote Rain Water Harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of Rain Water Harvesting for groundwater recharge in the notified areas, provided that in urban areas within the notified area, no directions issued under these rules shall be applicable for construction of rain water harvesting structures: (a) in residential or commercial premises having plinth area of less than 100 square metres; or (b) in the sinking zones, where construction of Rain Water Harvesting Structures would be detrimental to the safety of the building structures in the area.

Himachal Pradesh Public Records Act, 2006 (Act No. 24 of 2006): It's an Act to regulate the management, administration and preservation of public records of the State Government, Public Sector Undertakings, Statutory Bodies and Corporations, Commissions and Committees constituted by the State Government and matters connected therewith or incidental thereto. Under the said Act, Himachal Pradesh Public Records Rules were framed in 2008.

Land Acquisition (Companies) Rules, 1963: In exercise of the powers conferred by Section 55 of the Land Acquisition Act, 1894 (1 of 1894), the Central Government made rules for the guidance of the State Government and the Officers of the Central and State Governments.

Notification No. IPH-B (F) 10-3/2004: A penal levy would be charged for non metring of domestic drinking water connection @ of Rs 60 per connection per month within two months from the issuance of this Notification to ensure that metres are installed. This rate will be doubled every four months in the event of continued non- metring.

Commercial urban and rural consumers of drinking water will install the metres within one month from the date of this notification. Till then, the average consumption being charged at present will continue. If metres are not installed within one month, the average rate of consumption charges will be doubled. To ensure the installation of metres, this rate will double every two months thereafter.

The Himachal Pradesh Town and Country Planning Rules, 1978: The Rules outline regional planning, planning areas and development plans, control of development and use of land etc. Appendix I of the Rules gives guidelines for permission to change land use, or to develop land or to sub divide land in areas where land use is frozen and interim development plan or development plan has not been prepared. Section 15 of the Appendix I mentions "Ecology not to be disturbed," which is further defined as: (1) Change of land use or the development of land shall be made in such a manner that natural profile of the land is least disturbed. (2) Where it is essential to develop a plot by cutting, it shall be the responsibility of the plot owner to provide according to the engineering specifications, retaining and breast walls so that such cutting of natural profile of the land may not harm the adjoining uphill side properties. However, cutting of natural profile shall not exceed more than one storey (three metres in any case having a provision of diaphragm wall for step housing). (3) Change in the use of land or the development of land shall be made in a manner so as to achieve maximum air, light and sun where it is needed the most.

Himachal Pradesh Town and Country Planning (Amendment) Rules, 2009: In Appendix-I appended to the Himachal Pradesh Town and Country Planning Rules, 1978, after serial number 19, the following shall be added, namely 20. Solar Passive Design. The Amendment defined the scope of Solar Passive Building Design as required in

the buildings. The scope includes (i) All the Government and Semi-Government buildings; (ii) Public and Semi-Public Institutions including educational, health, community centres, banquet halls, inns and buildings of autonomous bodies; (iii) Urban Local Bodies and *Panchayati Raj* Institutions; (iv) Residential buildings in urban and urbanisable areas; (v) Residential colonies and apartments; (vi) Commercial complexes and buildings related thereto including hotels, resorts, lodges and guest houses; (vii) Industrial buildings and complexes thereof; (viii) Transport buildings, such as airport terminals, bus terminals, railway stations etc.; and (ix) New townships. The amendment also defines specifications of Building Map, Site Selection, Planning of Spaces, Integrating Solar Heating Systems in Building Designs, Solar Photovoltaic Panels (SPV) for lighting, solar passive cooling design features, reducing thermal losses, outer wall thickness and installation of solar assisted water heating system in buildings.

***Panchayats* (Extension to the Scheduled Areas) Act, 1996 No. 40 of 1996 (24h December, 1996):** It's an Act to provide for the extension of the provisions of Part IX of the Constitution relating to the *Panchayats* to the scheduled areas.

Himachal Pradesh *Panchayati Raj* (Extension to the Scheduled Areas) Rules, 2011: The provisions of these rules apply to the *Gram Panchayats*, *Panchayat Samitis* and *Zila Parishads* constituted in the scheduled areas of the State.

Himachal Pradesh Municipal Business Bye-Laws, 2006 : The said Laws have been formulated in exercise of the powers conferred by Section 279 read with Section 34 of the Himachal Pradesh Municipal Act,1994 (Act No.13 of 1994).

Other Sub-Programmes / Strategies

Although the Parliament does not have powers to legislate on the urban issues, the Ministry of Urban Development, Government of India has taken initiative for legal and regulatory reforms in the housing and urban development sector. Such initiatives are of two types:

- Advising State Governments with Model Legislations.
- Advising other Ministries of Government of India for legal reform in areas, which have bearings on the urban sector.

Model Legislations

The following model legislation have been prepared and circulated to all the State Governments to help them formulate their respective legislations to bring about uniformity in various State laws and also to simplify the regulations:

- Model Rent Control Legislation
- Model Apartment Ownership Legislation
- Model Property Regulation Legislation
- Model Urban and Regional Planning and Development Legislation
- Model Legislation regarding Housing Cooperatives.
- Model Chapter on Property tax for inclusion in the State Municipal Laws

Some States have already enacted laws/formulated bills on the basis of these model legislations.

Legal Reforms in Related Areas

The Ministry has proposed a series of reforms in related areas to create an enabling legal environment for speedier implementation of urban development schemes and for attracting larger participation of Private Sector. Some of these proposals are:

- Amendment of Land Acquisition Act, 1894 to speed up the process of acquisition and to delink the process of taking over possession of land from the process of determining compensation.

- Amendment of the Transfer of Property Act, 1882 to bring the concept of categorisation of mortgages in line with recent practices of housing and financial institutions, in particular, the English Mortgage and equitable Mortgage; lay down uniform Mortgage documents; introduce speedy and predictable system of foreclosure of mortgages; and to give legal shape to the rights of owners in multi storied apartments.
- Amendment of the Indian Stamp Act, 1899 and the Indian Registration Act, 1908 to delink the process of registration from the payment of stamp duty; to liberate the registration process from the requirement of various no objection certificates; and to rationalise stamp duties on various instruments.

Accelerated Urban Water Supply Programme (AUWSP): The programme is for towns having population less than 20,000 (as per 1991 Census). The objectives of the programme are to provide safe and adequate water supply facilities to the entire population of the towns having population of less than 20,000 persons (as per 1991 Census) in the country within a fixed time frame; (ii) to improve the environment and the quality of life; and iii) for better socio-economic condition and more productivity to sustain the economy of the country.

Interest Subsidy Scheme for Housing the Urban Poor (ISSHUP) – The scheme is an initiative to supplement the ongoing efforts to address the housing shortage. Under the scheme, interest subsidy of five percent per annum will be given for loans up to Rs. One *Lakh* taken during the Eleventh Plan. The loan repayment period would be 15-20 years. The details of the scheme are still in the process of being finalised by the Ministry of Housing and Urban Poverty Alleviation.

***Rajiv Awaas Yojana* (RAY)** - The scheme was announced by the Honourable President in her address to the Parliament in June 2009 with a vision to make the country slum free. The details of the scheme including coverage of cities, availability of land, admissible component, financing mechanism, involvement of PPP etc. are being worked out. Rs.150 *crores* has been earmarked for RAY for 2009-10 for making preliminary arrangements, like identification of slum dwellers, conduct of surveys of slum dwellers etc.

National Action Plan for Climate Change (NAPCC): NAPCC is guided by the principles as follows: Protecting the poor and vulnerable sections of society through an inclusive and sustainable development strategy, sensitive to climate change, achieving national growth objectives through a qualitative change in direction that enhances ecological sustainability, leading to further mitigation of greenhouse gas emissions, devising efficient and cost-effective strategies for end use, demand side management, deploying appropriate technologies for both adaptation and mitigation of greenhouse gases emissions extensively as well as at an accelerated pace, engineering new and innovative forms of market, regulatory and voluntary mechanisms to promote sustainable development, effecting implementation of programmes through unique linkages, including with civil society and local Government institutions and through Public Private Partnership, welcoming international cooperation for research, development, sharing and transfer of technologies enabled by additional funding and a global IPR regime that facilitates technology transfers to developing countries under the UNFCCC.

There are Eight National Missions, which form the core of the National Action Plan, representing multi-pronged, long-term and integrated strategies for achieving key goals in the context of climate change. While several of these programmes are already part of our current actions, they may need a change in direction, enhancement of scope and effectiveness and accelerated implementation of time-bound plans. The eight missions are: National Solar Mission,

National Mission for Enhanced Energy Efficiency, National Mission on Sustainable Habitat, National Water Mission, National Mission for Sustaining the Himalayan Ecosystem, National Mission for "Green India", National Mission for Sustainable Agriculture and National Mission on Strategic Knowledge for Climate Change.

Strengthening of Rain Water Harvesting Operation and Management system in Himachal Pradesh: The decision regarding Rain Water Harvesting was taken by the Himachal Pradesh Government for making compulsory the collection of rain water from the roof tops of buildings in the urban areas including commercial/industrial buildings located in the State as communicated by Secretary, Environment, Science and Technology to the Government of Himachal Pradesh vide to the Govt. of Himachal Pradesh D.O. No. EDN (S&T) A (3) 4/98, dated 30th November, 1999.

Necessary directions to make provision of rain water harvesting structures in new buildings and not to approve any map without such provision has been issued by the FC-cum-Secretary (UD) vide his letter No. UD-F (4) - II/98, dated 19-04-1999. Accordingly, all the 49 Urban Local Bodies were directed vide this office letter No. UDH (C) (10) Engg Cell-3/99-4713-4760, dated 22nd April, 1999 to incorporate the provision for rain water harvesting in their Building Bye-laws and to send the draft proposal for amendment of the building bye-laws.

Provision

The provision regarding Rain Water Harvesting structure incorporated/being incorporated in the Building Bye-laws is as under:

Collection of Rain Water from the Roof of Building: For Rain Water harvesting, a tank in the proposed building shall be constructed by connecting it with the gutter at the top of the roof. The capacity of the Rain Water Harvesting structure shall be proposed in the plan as under:

Sr. No.	Roof top area (sq. mtrs.)		Capacity in Ltrs.
1	100	2,000	
2	150		3,000
3	200	4,000	
4	500		10,000
5	1000	20,000	

The Government of Himachal Pradesh has approved the provision of rain water harvesting structure compulsory as per provision in Section-107 of Himachal Pradesh Municipal Act, 1994 in all the new buildings to be constructed within the jurisdiction of Municipal Councils/*Nagar Panchayats* in the State to stop the misuse of expensive treated water.

Implementation

So far, 12 Urbal Local Bodies have incorporated the provision of Rain Water Harvesting in their building bye-laws. The remaining 37 number of Urban Local Bodies are in the process of preparation/amendment of their building bye-laws to incorporate the provision of Rain Water Harvesting.

Central Council of Local Self Government Recommendation (CCLSG): Every State should have a Directorate of Municipal Committees under the charge of a Senior Officer with considerable knowledge and experience in Local Administration. The Directorate would exercise close supervision over the working of Chief Executive Officers and also give necessary guidance to local bodies. It will also function as the inspectorate of local bodies and by undertaking routine inspections, it would ensure that the performance of the local bodies is up to the mark.

CCLSG Resolution: The executive committee felt that the objectives of the Planning Commission for the preparation of city development plans and their integration with the State plans will not be fulfilled unless a

small cell is created in each State for taking up these problems and for guiding the local bodies in the preparation of their schemes and plans. It was resolved that while the State Government should meet the full cost of setting-up of the Directorate of Urban Local Bodies, the expenditure connected with the setting-up of a City Development Plan Cell in these directorates should be met from a 100 percent grant from the Centre. Such a grant will be conditional on the setting up of a Directorate of Urban Local Bodies.

Shimla Urban Transport Management Society (SUTMS): In pursuance of the stimulus package announced by the Government of India on 02-01-2009 for the purchase of buses for the Urban Transport System under the Jawaharlal Nehru Urban Renewal Mission (JNNURM), the Department of Urban Development, as per the guidelines for financing purchases of buses for Urban Transport System of JNNURM purposes, would set up an autonomous Society for the Management of Urban Transport System in Shimla city. The area of operation of the Society shall be Shimla Urban Agglomeration.

The aims and objectives of the Society would be to: look after the operation and management of Urban Transport System in Shimla agglomeration and provide improved public transport services to the public; facilitate coordinated planning and implementation of projects relating to urban transport in Shimla town, along with their integrated management; act as an umbrella regulatory and institutional public body for the management of urban transportation and providing efficient city bus service, with respect to JNNURM buses, HRTC buses, private bus services in Shimla town; and manage common urban transport related infrastructure and services etc.

Jawahar Lal Nehru National Urban Renewal Mission (JNNURM): The Hon'ble Prime Minister of India launched JNNURM on 3rd December, 2005. The mission aims at creating economically productive, efficient, equitable and responsive cities in an integrated framework with economic and social infrastructure, basic services to urban poor and strengthening of various Municipal organisations and their functioning. Under this mission, only Shimla town, being the State Capital, has been covered by the Government of India. The Himachal Pradesh Housing and Urban Development Authority (HIMUDA) has been nominated as the Nodal Agency for this purpose. Activities like development of roads, sewerage, parking, tunnels and garbage management etc. will be taken up for execution under this programme. There is a budgetary provision of Rs. 1036.00 *lakhs* under the scheme during the financial year 2008-09 as State's share. The following projects have been approved by the Government of India:

Capacity building activities including research and training towards implementation of BSUP and IHSDP under JNNURM. 2. Widening and lowering of existing tunnel near Aukland House School on motor round road Shimla. 3. Ashiana, a housing scheme for the poor of Shimla town. 4. Setting up of Solid Waste Management Improvement of Shimla city. During the year 2008-09, it has been proposed to take up projects, like the development of a Golf Course at Naldehra, parking places and augmentation of water supply system in Shimla.

Environment Improvement of Urban Slums (EIUS): Under the Environment Improvement of Urban Slums programme, there is a budgetary provision of Rs. 244.00 *lakhs* for benefiting 3200 slum dweller families. The funds under this scheme are meant for providing basic amenities, such as community baths, latrines and night shelters to avoid further environmental degradation of the towns.

Swarna Jayanti Shahri Rojgar Yojana (SJSRY): This is a Centrally sponsored scheme. The main objective of the scheme is to uplift the urban poor by providing employment to unemployed or under employed poor through encouraging setting up of self-employment ventures or by providing

wage employment. For the implementation of SJSRY, a sum of Rs. 13.99 *lakhs* has been provided in the budget for the financial year 2008-09, as State's share for benefiting the identified urban poor families.

Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT): The Government of India has restructured the old scheme of IDSMT and renamed it as Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) for implementation from the year 2006-07. HIMUDA has been declared the Nodal Agency for plan formulation and execution of the scheme. Three towns, namely, Hamirpur, Dharamshala and Mandi have been covered under the scheme. Though the project of Chamba town had been approved by the Government of India during the year 2007-08, but no funds have been released so far. For the implementation of this scheme, a sum of Rs. 50.00 *lakhs* as State's share has been kept in the budget for 2008-09. Efforts are afoot to cover more towns under this scheme during the current financial year.

Rajiv Gandhi Urban Renewal Facility (RGURF): Under this, car parking, Solid Waste Management, parks and community toilets will be constructed in the ULBs under the scheme. A sum of Rs. 100.00 *lakhs* has been kept in the budget for the implementation of this scheme during the financial year 2008-09.

Sewerage and Sanitation: In a meeting held under the Chairmanship of Chief Secretary it was decided that sewerage development plan will be administered by the Urban Development department instead of Irrigation & Public Health Department w.e.f. 1.4.2008. Hence the previous programme under this head and activities prepared for the annual plan 2008-09 are summarised as under: There are total 56 towns in Himachal Pradesh, out of which 49 towns are under Irrigation and Public Health Department. 6 towns (Yol, Bakloh, Kasauli, Sabhatu, Dagshai and Dalhousie Cantonment) are under Cantonment Boards and Parwanoo is under Housing Board. Sewerage schemes for 13 towns namely, Sh. Naina Deviji, Chamba, Mandi, Bilaspur, Palampur, Rohroo, Shimla, Manali, Ghumarwin, Jawalamukhi, Arki, Jogindernagar & Rampur, 2 rural / tribal schemes Sarahan & Reckong Peo respectively have been completed up to 31st March, 2007.

11th Five Year Plan (2007-12): The proposed outlay for Eleventh Five Year plan is Rs. 17060.00 *lakhs*. The physical target to complete sewerage schemes of 12 towns has been envisaged for the Eleventh Five Year Plan period.

Annual Plan (2007-08): The approved outlay for sewerage sector in annual plan 2007-08 was Rs. 2400.00 *lakhs*, which has been utilised in full. Physical target to cover three towns, namely, Paonta, Jubbal and Nagrota was fixed for the year.

Annual Plan (2008-09): An outlay of Rs. 3450.00 *lakhs* for sewerage schemes in the annual plan 2008-09 has been proposed, which has been budgeted for major works. The physical target for the completion of three schemes of Narkanda, Bhunter and Kotkhai has been proposed.

The Backward Regions Grant Fund (BRGF): It is designed to redress regional imbalances in development. The fund will provide financial resources for supplementing and converging existing developmental inflows into 250 identified districts, so as to:

- Bridge critical gaps in local infrastructure and other development requirements that are not being adequately met through existing inflows.
- Strengthen, to this end, *Panchayat* and Municipality level governance with more appropriate capacity building to facilitate participatory planning, decision making, implementation and monitoring to reflect local felt needs.

- Provide professional support to local bodies for planning, implementation and monitoring their plans.

BRGF is being implemented in Chamba and Sirmaur districts of Himachal Pradesh.

Hand Pumps Installation Programme: Drinking water facilities are also being provided through the important programme of hand pumps installation at locations of priority in drought prone/acute water scarcity areas. However, the programme is generally supplementing the existing piped water supply schemes in drought prone/water scarcity areas due to the limitation that hand pumps are being installed along road side locations only.

There are district level programmes, like *Vikas Mein Jan Sahayog* (People's contribution towards development) in which communities or individuals contribute about 25 percent of the amount for infrastructure development, and the rest is contributed by the Government.

Special Component Plan (SCP) renamed as Scheduled Castes Sub Plan (SCSP) for the Scheduled Castes: The Government formulated a Special Component Plan (SCP) renamed as Scheduled Castes Sub Plan (SCSP) for the Scheduled Castes as part of the State Plan. The Scheduled Castes Sub Plan is designed to channelise the flow of benefits and outlays from the general sectors in the State Plan and from the Union Ministry of Social Justice and Empowerment for the empowerment of Scheduled Castes in physical and financial terms. The Scheduled Castes Sub Plan is designed to help poor Scheduled Caste families through composite income generating programmes. In addition, this Sub Plan seeks to improve the living conditions of Scheduled Castes through provision of drinking water supply, link roads, house-sites, establishment of educational, health, veterinary institutions etc. This Sub Plan process includes identification, formulation and implementation of schemes/programmes under different sectors for the economic amelioration of the persons belonging to these communities. Outlays were specifically earmarked in the State Plan besides supplementation by the Ministry of Social Justice and Empowerment, Government of India by way of Special Central Assistance. The Tribal Sub Plan is area-based, whereas Scheduled Castes Sub Plan is directly benefiting the individuals/families and creating infrastructural facilities in the *bastis,* where Scheduled Caste concentration is 50 percent or more.

District Planning Cells: The District Planning Cells are engaged in the preparation of 'shelf of schemes' at the decentralised level to monitor the process of the implementation of all the plan schemes being run by various Departments soon after the approval of the budget. Besides, the Planning Cells also prepare the shelf of schemes under decentralised planning programmes VMJS. Sectoral Decentralised Planning and the Backward Area Sub-Plan. The Planning Cells play a pivotal role in reviewing the implementation of MPLAD and *Vidhayak Kshetra Nidhi Yojana* by convening the meeting of District Planning, Development and 20-Point Review Committees. In these meetings, the pace of expenditure and the level of development achieved through implementation of schemes are reviewed. Thereafter, the DCs and other Executing Agencies ensure taking up corrective measure from time to time. In addition to these activities, these units are engaged in the collection of data desired by the State Government and District Administration concerned with developmental activities and for the evaluation of schemes.

Local District Planning: The scheme was first introduced in the year 1984-85 to provide space for planning and implementation at the sub-State level from the year 1999-2000. This scheme was discontinued and a new programme called *Vidhayak Kshetra Vikas Nidhi Yojana* (VKVNY) was launched.

Vidhayak Kshetra Vikas Nidhi Yojana (VKVNY): Towards strengthening of

decentralisation process and for ensuring more active involvement of the elected representatives in addressing micro-level issues of development, the State Government started a new scheme called *Vidhayak Kshetra Vikas Nidhi Yojana* during the year 1999-2000. The scheme envisaged allocation of Rs. 15.00 *lakhs* per MLA for taking up developmental schemes/works against the most felt needs of the area in his constituency. The implementation of this programme ensures balanced development of all the areas in Himachal Pradesh irrespective of political affiliation and all elected MLAs also got equal treatment. The scheme was discontinued in the year 2001-02. The State Government resumed this scheme from the Annual Plan (2003-04).

Sectoral Decentralised Planning Programme in Himachal Pradesh: Sectoral Decentralised Planning (SDP) was introduced in 1993 in all the districts except the tribal areas of the Pradesh, pursuant to the recommendations of DCs Conference in 1993. Under this programme, five percent of the approved outlays in selected heads of development are taken out and, thereafter, allocated to the districts (non-tribal areas) according to the same formula as for the Local District Planning, i.e., 60 percent on the basis of population and 40 percent on the basis of geographical area. Funds thus pooled are placed at the disposal of districts as 'Untied Funds' to be utilised for redressal of such public grievances relating to works of small nature involving small financial implications as emerges in the district level 'Public Grievances Redressal Committee' meetings. The districts are given total freedom for identifying projects to be implemented under this programme. The guiding principle was that the schemes should be in the nature of meeting critical gaps or missing links and should also enhance the credibility of the grievance redressal machinery. The only constraint applied is that no diversions are allowed from earmarked outlays from rural water supply head of development. The Deputy Commissioner is required to get works approved from the District Planning Development and Twenty Point Programme Review Committee. The basic thought behind this measure was that, as and when District Level Public Grievances Redressal Committees meet, they are faced with minor developmental grievances, which do not find place in the budget and, at the same time, are so small in financial implications that these could be instantly met to enhance the satisfaction level of people through public grievances redressal machinery.

Sectoral Decentralised Planning - Revised Guidelines, 2004: Sectoral Decentralised Planning programme has been observed to be generally useful as district administration has been able to meet/redress the grievances of small nature. However, clarifications are sought by the districts on certain points, which come up during the course of implementation of this programme and necessary clarifications accordingly are issued by the Planning Department. Keeping in view the experience gained/clarifications issued under SDP from time to time, the need for compilation of detailed guidelines containing various clarifications already issued under this programme was felt. As per the decision of the Government, SDP Guidelines, 2004 serves as a handy tool in the process of implementation.

Member of Parliament Local Area Development Scheme (MPLADS): Members of Parliament are approached by their Constituents, quite often, for small works of capital nature to be done in their Constituencies. Hence, there was a demand made by MPs that they should be able to recommend works to be done in their Constituencies. Considering these suggestions, the Prime Minister announced in Parliament on 23rd December, 1993, the 'Member of Parliament Local Area Development Scheme'. Detailed guidelines on the Scheme concept, implementation and monitoring of MPLADS were subsequently issued by the Ministry of Rural Development in February, 1994, who initially handled the Scheme. The guidelines were revised in December, 1994 by this

Ministry. Pursuant to these guidelines, the Ministry issued Circulars, from time to time, on matters relating to operational details, based on suggestions received from Members of Parliament and others. Revised Guidelines were issued in February, 1997 and September, 1999. Thereafter, amendments to some provisions of the guidelines were issued from time to time. These guidelines are issued after incorporating amendments. Under this scheme, each MP will have the choice to suggest to the Head of the District works to the tune of Rs. One *Crore* per year, to be taken up in his/her constituency. Elected Members of Rajya Sabha, representing the whole of the State as they do, may select works for implementation in one or more district(s) as they may choose. Nominated Members of the Lok Sabha and Rajya Sabha may also select works for implementation in one or more districts anywhere in the country. The allocation per MP per year stands increased to Rs. Two *Crores* from the year 1998-1999.

MPs can also recommend works outside their constituencies/States for construction of assets that are permissible in the guidelines, for rehabilitation measures in the event of 'natural calamity of rare severity' in any part of the country for an amount not exceeding Rs. 10 *lakhs*, for each calamity.

This scheme has been introduced for implementation as a Central Sector Scheme from the year 1993-94. The objective of the scheme is to authorise MPs to recommend small works of capital nature demanded by their Constituents. Un der this scheme, each MP has the choice to suggest to District Collector works to the tune of Rs. 1.00 *crore* per year from the financial year 1994-95 (whereas for the year 1993-94, each MP could suggest works to the tune of Rs. five *lakhs* to be taken-up in their respective Constituencies) with each individual work not exceeding Rs. 10.00 *lakhs*. During the year 1998-99, the Government of India has raised the allocation under MPLADS from Rs. 1.00 *crore* to Rs. 2.00 *crores* per MP per year. The Planning Department has been declared the nodal agency for implementation of this scheme and it coordinates the implementation of this scheme with the concerned DCs. The illustrative list of works that can be taken up under the scheme are construction of school buildings; providing drinking water to the people in the villages, towns or cities by digging tube wells or other works, which may help in this respect; construction of village roads or approach roads; construction of bridges on the approach roads; construction of common shelters for the old or handicapped; construction of buildings for local bodies or for cultural and sports activities or for hospitals; social forestry, farm forestry, horticulture, parks and gardens in Government and community land; desilting of village ponds; construction of irrigation canals; construction of common gobar-gas plants, non conventional energy systems/devices for community use and related activities; construction of small irrigation *bandhs* or lift irrigation schemes or water table recharging schemes; public reading rooms or study rooms; crèches and Anganwadis; construction of public health care buildings including family welfare Sub-centres together with ANMs' residential buildings; crematorium/burial grounds; construction of public toilets and bathrooms, drains and gutters, footpath, path-ways and foot bridges; provision of civic amenities, like electricity, water, pathways, public toilets, etc. in slum areas of cities, towns and villages; provision of common work sheds in slums and for artisans; residential schools in tribal areas; bus-sheds/stops for public transport passengers; Veterinary-Aid Centres etc.

Backward Area Sub Plan: The most backward pockets in India had not been receiving adequate attention through the general process of development. It is in this context that the need for specific mechanism to take care of developmental backlog of such areas was felt towards the end of the Fourth Plan. The evolution of a sub-Plan concept manifested itself as the tribal sub-Plan across the country during the Fifth Plan. Even beyond this, it was realised that disparities in the level of development persisted in areas

outside the Tribal Sub Plan and such areas were not tribal areas by design of the Constitution of India. Redressal of such micro-level disparities was, perhaps, attempted in Himachal Pradesh during the seventies. To begin with such micro level pockets constituted very small areas with extreme economic backwardness with near total absence of basic developmental infrastructure. Hence, this necessity gave birth to the formulation of the Backward Area Sub Plan, which was designed to look after the developmental needs at the micro level for these identified areas. After the introduction of the Tribal Sub Plan in Himachal Pradesh in the beginning of the Fifth Five Year Plan, the most backward pockets outside the Tribal belt started receiving special attention towards development of backward areas. The objectives of BASP is to reduce regional disparities; evolve suitable policy for the development of the Backward Areas; decentralisation of planning process; ensure people's participation in planning and decision making; provide better coordination and integration of development programmes; effective mobilisation of resources at district level; reduce communication gap between people and the Government; more powers to people at local level; and evolve effective decision making system at the district level.

The basic criteria decided for this purpose was remoteness, inaccessibility, coupled with visual perception of the level of socio-economic development and infrastructure backwardness. A total number of 489 *Gram Panchayats* out of 3037 *Panchayats* have been declared as Backward *Panchayats* in Himachal Pradesh.

Border Area Development Programme (BADP): BADP was extended to Himachal Pradesh during 1998-99 by the Government of India (GoI). Objectives of the BADP are to meet the special needs of the Border Area People and to fill up the critical gaps in the development. The criteria for funding are length of International Border, population of Border Blocks and area of Border Blocks. BADP is a 100 percent Centrally funded programme. The Planning Commission, Government of India provides SCA under this programme (within the approved outlays). Additional SCA over and above the normal State share of BADP is also received from GoI. The scheme is implemented through Tribal Development Department of Himachal Pradesh. Kalpa and Pooh Blocks of Kinnaur and Spiti Block of Lahaul and Spiti districts are covered under BADP.

District Plans in the Eleventh Five Year Plan: The Eleventh Five year Plan (2007-12) lays considerable emphasis on the formulation of district plans from the *Panchayat* level based on participatory approach, which needs to be approved from the District Planning Committee (DPC) as per the recommendations of the Expert Group on planning at grassroots level. As a first step, Himachal Pradesh has constituted the District Planning Committees in all the districts. The *Panchayati Raj* Department has been entrusted with the function of the preparation of District Plans by involving all the Deputy Commissioners and the District Planning units in this exercise.

Notice for Publication of Draft Regulations for Installation of Communication Towers in Development Plan: Annexure A sets Rules for the installation of Communication Towers: The Rules define Communication Tower, which shall include antenna fixtures, fabricated antenna, tower to install the telephone lines and transmission towers. This will not include the antennas installed for domestic purpose, namely television antennas or dish antennas. The Rules also gives details on location. Location of Communication Towers is governed by radio frequency system and cellular operators shall avoid residential areas for erection of the same. The location shall be decided as: (i) First preference shall be given to the location of tower in the Forest areas. (ii) Second preference shall be given to the location of tower in open or public areas away from residential locations. (iii) Where it is not possible to avoid the location of the tower in residential area, the same shall be located in open space or park, with prior consent of

owners of adjoining residential houses. (iv) Erection of tower shall not be allowed within a radius of 100 metres from residential building, school and hospital. The Rules defined the 'Installations' as (i) In order to avoid any eventuality due to thunder storm, lightning conductors have to be installed; (ii) Generator set installed at the tower site to cater to the power requirements of the antenna shall conform to the noise and emission norms prescribed by the Himachal Pradesh Pollution Control Board. The Rules define conditions for 'Sharing of Sites', as the Telecom Operators may share the towers for fixing their respective antennas; the same are, however, required to adhere to the prescribed technical requirements, so as to curtail multiplicity of towers as well as to optimise the use of the existing ones.

Citizens' Charter of Town and Country Planning Directorate: The vision of the said Charter is to extend the provisions of Act to urban areas, growth centres, ribbon development, potential areas etc. by notification of Planning Areas/Special Areas for Comprehensive Planning, Preparation of Development Plans, Sectoral Plans, Schemes, Projects etc. for Planning Areas and Special Areas for Sustainable Development; implementation of Act, Rules, Regulations and Directions for ensuring planned and regulated development in the interest of common man as well as the community; public awareness regarding environment, heritage, spatial planning, sustainable development etc.; imperatives and finalisation and implementation of spatial plans by involvement of stakeholders and common man.

Permissible Area Standard/Norms for Different Parts of a Building: Town and Country Planning Department has defined permissible area standard/norms for different parts of a building. Guidelines for constructing earthquake resistant structure: Town and Country Planning Department has defined following guidelines for constructing earthquake resistant structure, which includes, *inter alia:* Since earthquake force is a function of weight, the building should be as light and small as possible. Besides, the roof as well as upper storey should be kept light; heavier floors should be planned at bottom levels only. Due consideration should be given to the prevailing soil conditions. It's better if the stratum is hard and firm. Avoid planning huge structures on loose sandy soils or where the site is water prone. In these situations, there always exists a possibility of liquefaction - a situation in the event of an earthquake, when the soil loses strength and behaves as a fluid. Length of a building may not exceed three times its width. Buildings having plans or shapes like L, T, E, Y etc. should be separated by rectangular parts by adequate separation.

In case of R.C.C. structures, columns should be stronger than beams, especially the end and periphery columns. The columns should preferably be symmetrical and R.C.C. shear walls must be incorporated as an essential feature in both the directions. On record, no building with shear walls has ever collapsed in the event of a tremor. Non-structural parts, like almirahs, shelves, parapets, water tanks should be properly tied to the structural parts of the buildings.

The premises around the buildings must be developed properly. In hill areas, slopes should be developed in steps/terraces or through retaining works. There must be efficient system of disposal of all types of water - rain, drainage, sewage etc. No illogical or *ad hoc* additions - vertically as well as horizontally – should be made to the building once it has been completed according to a structural design. All temptations for additional area or floor must be avoided.

2.11 Municipal Solid Waste

The Policies and laws applicable and/or related to the State's waste disposal (MSW)/hazardous waste) sector development, along with a brief description of their relevance, are listed below. Detailed explanations can be acquired from the

websites of relevant Departments, line Ministries, like Ministry of Environment and Forests (www.envfor.nic .in), Ministry of Urban Development (www.urbanindia.nic.in), and Directorate of Urban Development, Himachal Pradesh (www.hpurbandevelopment.nic.in), and Himachal Pradesh Pollution Control Board (http://hppc.nic.in).

National Level Policies / Regulations

National Urban Sanitation Policy: The National Urban Sanitation Policy urges States to come up with their own detailed State-level urban sanitation strategies and city sanitation plans. It moots the idea of totally sanitised cities and the setting up of a multi-stakeholder city sanitation task force to achieve this objective. Environmental considerations, public health implications and reaching the unserved and urban poor are given significant emphasis in the Policy.

The vision for urban sanitation in India as per the National Urban Sanitation Policy is: All Indian cities and towns become totally sanitised, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women. As per the key sanitation Policy issues highlighted in National Urban Sanitation Policy, the ones, which must be addressed are: a) *Poor Awareness* - Sanitation has been accorded low priority and there is poor awareness about its inherent linkages with public health; b) *Social and Occupational aspects of Sanitation* - Despite the appropriate legal framework, progress towards the elimination of manual scavenging has shown limited success. Little or no attention has been paid towards the occupational hazards faced by sanitation workers involved in manual scavenging; c) *Fragmented Institutional Roles and Responsibilities* - There are considerable gaps and overlaps in institutional roles and responsibilities at the National, State, and city levels; d) *Lack of an integrated city-wide approach* - sanitation investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal.

National Health Policy 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to decentralised public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions.

The Policy hoped that the independently stated Policies and Programmes of the environment related sectors be smoothly interfaced with those of the health sector, in order to reduce health risk to the citizens and the consequential disease burdens.

This Policy welcomes the participation of the Private Sector in all areas of health activities – primary, secondary and tertiary. The Policy recognises the significant contribution made by NGOs and other institutions of the civil society in making available health services to the community. It also emphasises the need to simplify procedures for Government – Civil Society interfacing in order to enhance the involvement of Civil Society in public health programmes.

National Rural Health Mission (2005-12): The National Rural Health Mission (NRHM) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 States including Himachal Pradesh, which have weak public health indicators and/or weak infrastructure. It has as its key components, a village health plan prepared through a local team headed by the Health and Sanitation Committee of the *Panchayat*; and integration of vertical Health and Family Welfare Programmes and funds for optimal utilisation of funds and infrastructure and strengthening the delivery of primary healthcare. It aims at effective integration of health concerns with determinants of health,

like sanitation and hygiene, nutrition and safe drinking water through a district plan for health. The major goals of NRHM include reduction in Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR) and universal access to public health services, such as water, sanitation and hygiene.

The Plan of Action of this Mission has ten components. These components include district health plan, converging sanitation and hygiene, and Public Private Partnership for achieving public health goals. The mission envisages the following roles for PRIs: The Village Health Committee of the *Panchayat* would prepare the Village Health Plan (VHP) and promote inter-sectoral integration. It also seeks the provision of training to members of PRIs.

The National Water Policy, 2002: This National level Policy addresses the water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. Policy states about the use of water, water conservation and quantification of water pollution.

Section 1.2 states that rivers and underground aquifers often cut across State boundaries. Water,asaresource,isoneandindivisible.
Therefore, rainfall, river waters, surface ponds and lakes and groundwater are all part of one system.

Section 7.3 states that integrated and coordinated development of surface water and groundwater resources and their conjunctive use should be envisaged right from the project planning stage and should form an integral part of the project implementation.

Section 14.5 states that necessary legislation is to be made for the preservation of existing water bodies by preventing encroachment and deterioration of water quality.

Section 25 states that for effective and economical management of water resources, the frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in several areas including the following: assessment of water resources; water quality; water conservation; evaporation and seepage losses; recycling and re-use; better water management practices and improvements in operational technology; economical designs for water resource projects; sedimentation of reservoirs; prevention of salinity ingress; prevention of water logging and soil salinity; reclamation of water logged and saline lands; environmental impact; and regional equity.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

The National Mission on Sustainable Habitat comprises management of Municipal Solid Waste, besides promoting energy efficiency in the residential and commercial sector and urban public transport.

Management of Municipal Solid Waste (MSW): Municipal Solid Waste (MSW) generation reflects not just income levels, but also lifestyle choices. Recycling of materials is an important option for reducing environmental pressures. India has a significantly higher rate of recycling of Municipal Solid Waste materials than developed countries. Green House Gas emissions from Municipal Solid Waste in India are also much lower than in developed countries, reckoned per unit of consumption (in $ 1000 at PPP).

Municipal Solid Waste generation in Indian cities (around 5100 ULBs) is estimated to have increased from six million tonnes in 1947 to 48 million tonnes in 1997, and 69 million tonnes in 2006 (Central Pollution Control Board, 2000 and TERI, 2001). In addition, Indian consumption of plastics is around four MTPA (million tonnes per annum). About 60 percent of this comprises polyolefins, which are primarily used as packaging material. About 2.0 MTPA of total consumption is generated as plastic waste of which around 70 percent is recycled, mostly by the informal sector. The decadal growth in consumption of plastics during the period 1991-2001 was around 14 percent (Indian Centre for Plastics in the Environment and Central Institute of Plastic Engineering Technology, 2003). Although the quantity of plastic waste reaching disposal sites is fairly low (0.62 percent on a dry weight basis), testifying to the high rate of recycling/reuse, the management of thin plastic bags remains a matter of concern due to low collection efficiency in their case. The plastic waste-recycling sector, therefore, needs to be strengthened.

There is a trend of increase in the percentage of recyclables, accompanied by decrease in the percentage of biodegradable matter in the waste stream.

Policies and Regulations

The 74th Constitutional Amendment (1992) transferred the responsibility for collection, treatment and disposal of Municipal Solid Waste from State Governments to the Urban Local Bodies (ULBs). The outbreak of plague at Surat (1994) focused Policy attention on the importance of proper systems for Municipal Solid Waste in the ULBs. In response to direction by the Supreme Court in a PIL (WP No. 888/1996), the Municipal Solid Waste Rules, 2000 were promulgated; Municipal Solid Waste service from generation to disposal was mandated; and Local Governments were made responsible for their compliance. Since then, ULBs have gradually improved the system of collection and transport of Municipal Solid Waste. However, major gaps exist in respect of treatment and disposal. In particular, in respect of disposal, the compliance is poor (less than five percent), and while there are an increasing number of projects incorporating safe disposal, most have inadequate capacity.

Efforts at composting and generating energy from waste have generally not been successful for a variety of systemic, technology, and pricing issues including variable quality of waste, insufficient segregation of Municipal Solid Waste, opposition to siting the facilities from local residents, and accordingly, the practice of open dumping continues. The dominant technology choice remains composting.

In addition, experience has made clear that Municipal Solid Waste operations cannot overall be profitable, and while cost-effectiveness and revenue streams should be pursued, Municipal Solid Waste operations as a whole should be recognised as entailing the provision of a public good (or environmental service), generally requiring net fiscal expenditures by the concerned local bodies.

The Municipal Solid Waste (MSW) Rules under the Environment (Protection) Act, 1986 are currently somewhat focused on specific treatment options, including the chain of collection, transport and disposal. This focus is unduly prescriptive, and prevents innovation in systems and procedures, as well as update on new technologies and techniques. The Municipal Solid Waste Rules should be revised to focus instead on performance or outcome norms that are to be met, irrespective of particular systems and procedures, or technologies. This would provide benchmarks for monitoring and enforcement, as well as give space for innovation in systems, procedures, and technologies.

There is an emerging consensus that Municipal Solid Waste Rules should enable (but not require) the sharing of infrastructure, including transport and treatment facilities, across a given region, including towns and

villages. This would help realise scale economies, besides access to better and more cost-effective systems and treatment options for the smaller urban centres and habitations.

Broad guidelines for Policy reform in the Municipal Solid Waste sector include:

- Common Regional Facilities: In respect of smaller towns and villages located in a region, say a district, disposal facilities should be developed as a common regional facility.
- Integrated systems for collection, transport, transfer, treatment, and disposal facilities: even if different organisations implement different components, as opposed to stand-alone facilities and open dumping.

Municipal Solid Waste operations cannot be financially viable: ULBs should not expect to realise net royalties for treatment and disposal of MSW, and a tipping fee would be necessary (reckoned on tonnage of MSW or number of sources of different kinds) to be met from ULB revenues.

While there are several potential benefits in implementing Municipal Solid Waste operations through Public Private Partnerships, including cost-effectiveness, as compared to operations carried out by the local bodies on their own, it is imperative that Municipal finances are placed on a sound footing prior to outsourcing this function. While the issue of Municipal financial reform is complex with many dimensions, and needs to be pursued independent of Municipal Solid Waste issues, a pre-requisite is separation of the accounts of the local bodies in respect of their different responsibilities, such as Municipal Solid Waste, water supply, sewage disposal and roads. This separation would firstly, provide guidance for setting user charges (however collected), and a benchmark against which bids for provision of Municipal Solid Waste services may be judged.

R&D Needs

Technological requirements are listed as follows:

- Biomethanation technology for waste to energy including its decentralised application for segregated waste streams, like vegetable market waste, slaughterhouse waste and dairy waste.
- Development of indigenous gas engines for waste to energy applications to reduce the overall cost of the package.
- Upgrading plastic waste recycling technologies to reduce occupational and environmental hazards.

Financing

The 10th Plan emphasised provision of important infrastructure facilities and 100 percent coverage of urban population with water supply facilities, and 75 percent of urban population with sewerage and sanitation by the end of the plan period. Under the JNNURM, till January 2008, funds amounting to Rs. 900 *crores* were released to ULBs. The required funding for upgrading Municipal Solid Waste facilities in all cities and towns would be much greater.

The National Environment Policy (NEP), 2006: It provides for removal of barriers (incentives, regulations) for beneficial utilisation of non-hazardous materials Implementing viable Public Private Partnership's for operation of hazardous and non-hazardous waste disposal facilities on payment of user fees, taking into account concerns of local communities. It stipulates:

- Survey and preparation of national inventory of toxic and hazardous waste sites and online monitoring of their movement.
- Giving legal recognition to and strengthening informal sector systems of collection and recycling and enhancing their access to finance and technology.

The significance of the second point is that while the informal recycling sector is the backbone of India's highly effective recycling system, unfortunately, a number of Municipal regulations impede the operation of the recyclers, owing to which they remain at a tiny scale without access to finance or improved recycling technologies.

Environment (Protection) Act, 1986: This is the most significant and diversified National level Act to safeguard the natural environment. It has several rules under it to address different environmental problems, like hazardous waste disposal, plastic use and disposal etc. The Environment (Protection) Act, 1986, amended in 1991, has been enacted to safeguard the natural environment. The Environment (Protection) Act, 1986, defines the power of the Central Government to take measures to protect and improve the environment, which includes water, air and land and the inter relationship, which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O. 844 (E), [19/11/1986]. The power conferred by the Environment Protection Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Municipal Solid Wastes (Management and Handling) Rules, 2000: Section 3 defines disposal of Municipal Solid Wastes in terms of specified measures to prevent contamination of groundwater, surface water and ambient air quality. 'Transportation' means conveyance of Municipal solid wastes from place to place hygienically through specially designed transport systems so as to prevent foul odour, littering, unsightly conditions and accessibility to vectors. These rules apply to every Municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of Municipal Solid Wastes.

Plastics Waste Management (PWM) Rules 2011: As per Rule 4 (a) Concerned State Pollution Control Boards/Pollution Control Committees (SPCBs/PCCs) are empowered for enforcement of rules relating to registration, manufacture, recycling and disposal of plastics bags/containers. As per Rule 4 (b) the concerned Municipal Authority is empowered for the enforcement of rules relating to use, collection, segregation, transportation and disposal of post consumer Plastic Waste (PW).

Bio-Medical Waste (Management and Handling) Rules, 1998/2003: These Rules apply to all, who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining to or in production or testing of biologicals. Section 4 of these rules specifies the duty of occupier to take all steps to ensure that such waste is handled without any adverse effect to human health and environment. As per Rule 14 of the Bio-medical Waste (M&H) Rules, 1998, "*the Municipal Corporation, Municipal Boards or Urban Local Bodies, as the case may be, shall be responsible for providing suitable common disposal/incineration sites for biomedical waste generated in the area under their jurisdiction.*"

The Water (Prevention and Control of Pollution) Act 1974, (Amended in 1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government, through Central and State Pollution Control Boards, to prescribe

standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the Prevention and Control of Water Pollution and for maintaining or restoring of wholesomeness of water. Section 2 of the act defines pollution as contamination of water or such alteration of the physicals, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or of aquatic organisms.

Chapter 5 of the Act on Prevention and Control of Water Pollution deals with the power of State Government to restrict the application of the Act to certain areas; power to obtain information; Power to take sample of effluents and procedure to be followed; seek reports of the result of analysis on samples taken under section; power of entry and inspection; prohibition on use of stream or well for disposal of polluting matter, etc; restrictions on new outlets and new discharges; provision regarding existing discharge of sewage or trade effluent; refusal or withdrawal of consent by the State Board; appeals; revision; power of State Board to carry out certain works; furnishing of information to the State Board and other agencies in certain cases; emergency measures in case of pollution of stream or well; power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and power to give directions.

The Air (Prevention and Control of Pollution) Act 1981 (as amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings on living creatures or plants or property or environment.

The Factory Act, 1948: This Act is a major legal instrument to ensure safety, health and environment at work place. Chapter III of the Act addresses health issues at work place. Chapter IV describes issues related to safety. Chapter IVA of the Act describes provisions relating to hazardous processes.

Environment Impact Assessment (EIA) Notification, September 14, 2006 and subsequent Amendments: Municipal Solid Waste Projects are included in the list of Projects or activities requiring prior Environmental Clearance. EIA notification makes Environment Impact Assessment study mandatory for setting up Common Municipal Solid Waste Management Facility as given in the Schedule (7i) of the said notification. Public hearing has also been made mandatory as part of the process of seeking environment clearance.

Other Ministry of Health and Family Welfare, Government of India Guidelines include guidelines on Integrated Management of neonatal and childhood illnesses; guidelines for Village Health and Sanitation Committees, SC, CHCs, PHCs, which include guidelines regarding the constitution of Village Health and Sanitation Committees and utilisation of untied grants to these Committees; guidelines for use of Sub-centre (SC) funds under NRHM; guidelines for utilisation of untied fund and, annual maintenance grant for Primary Health Centres; suggested guidelines for implementation of Indian Public Health Standards in Sub-centres, Primary Health Centres and Community Health Centres. All these guidelines are available on the website.

These also include broad framework for the preparation of District Health Action Plans, guidelines for constitution of *Rogi Kalyan Samiti* (RKS)/Hospital Management Societies; framework for developing health insurance programmes; and guidelines for Department of Family Welfare supported NGO Schemes.

Establishment of *Parivar Kalyan Salahkar Samiti* (PARIKAS): Himachal Pradesh has set up Health and Family Welfare Advisory Committees known as *Parivar Kalyan Salahkar Samiti* (PARIKAS) at the *Panchayat*, block and district levels for the involvement of the PRIs. The functions of the *Panchayat* PARIKAS include supervision and monitoring; implementation of national health programmes; ensuring cleanliness of the villages; checking pollution of water, air and noise; making people aware of dog and snake bites and their first aid treatment; cleaning and using bleaching powder etc.

State Level Policies/ Regulations

Draft Urbanisation Policy, 2009: The Urbanisation Policy Section 15 outlines Planning of Basic Infrastructure including Municipal Solid Waste.

Organic growth of roads, water supply, sewerage, drainage, electrification and telecommunication networks is an area of vital concern. These critical issues have to be effectively dealt with by the Development Authority in accordance with provisions of Regional Plans, Development Plans of Planning Areas, Special Areas, Sector plans, Schemes and Projects. As roads act as decisive factor for the services infrastructure, the same have to be given foremost attention by the Development Authority in terms of their width and systematic provisioning of infrastructural services along them.

Planned development of roads has to be ensured in view of their hierarchy, population and activity requirements, so that infrastructural services come up in a systematic manner along them.

Provision of ducts have to be made along the roads, so that the services are laid through them, to ensure their effective running and maintenance, lack of disturbance to traffic and to effect the economy.

Solid Waste Management is required to be ensured at various levels, namely, at household level by segregating the waste, at locality level by making provision for composting in each new locality and at town level by disposal and treatment of non-bio-gradable wastes.

Multiplicity of water supply lines, running parallel to each other, has to be avoided and proper designs according to the size of population of each locality need to be prepared and implemented, so that on the one hand, efficiency is ensured and leakages are minimised and on the other, economy is affected.

Tourism Policy, 2005: This Policy document aims to provide clear directions for the development of tourism in the State. It seeks to harness the fullest potential of the State for the development of tourism, which, in turn, can be a prime engine for economic growth and prosperity of the State, besides effectively addressing the problems of unemployment and poverty.

The major objectives of the policy is to: (1) establish Himachal Pradesh as a leading tourist destination in the country and abroad; (2) to make tourism a prime engine for economic development and prosperity of the State and as a major means for providing employment; (3) to encourage a strong and sustainable Private Sector participation in creation of tourism infrastructure, especially through Public Private Partnerships; (4) to promote Sustainable Tourism, which is not only environmentally compatible, but also leads to economic betterment of the rural people; (5) to attract quality tourists and to extend their stay in the

State; (6) to safeguard the State's natural and manmade heritage; (7) to encourage Civil Societies and Non-Governmental Organisations for the promotion and conduct of tourism related activities; (8) to position Himachal Pradesh as a one stop destination for adventure tourism.

The Government proposes to replicate Manali model of collection of 'Green Fee' from tourists in other major tourism destinations. The funds so collected will be secured for 10/15 years and sizeable Tourism Master Plans would be created and implemented in a time bound manner.

The State Government will take steps to ensure proper hygienic conditions and to prevent the exploitation of tourists on National and State Highways and at tourist places. The Government proposes to classify the *dhabas* situated on the National and State Highways. The classification will be done on the basis of facilities provided, hygienic condition, quality of the food, availability of toilets, parkings etc.

Rules of the Eco-tourism Society of Himachal Pradesh (ECOSOC) as per revised Eco Tourism Policy of Government of Himachal Pradesh 2005.

Section 25 describes the functions of the Chief Executive Officer, Tourist Facilities, (b). It mentions about "Improving the waste disposal around Heritage FRH/forest trails/other FRH/camp-sites/film shooting grounds."

Vision for Eco-tourism in Himachal Pradesh fosters environmentally benign tourism through recognised standards for rural accommodation provision, minimising of waste, reduction of pollution and minimising environmental depleting fuel consumption.

Guidelines for Eco-tourists: These guidelines, meant for eco-tourists, urge them to observe the following practices: Keep local water sources clean and avoid using chemical detergents in streams or springs. If no toilet facilities are available, make sure you defecate at least 30 metres away from any water source, ensuring to bury any waste. Conservation of water is vital, especially drinking water. Water from Kitchen waste or rain-water collected through regular harvesting can be used for sanitation and other uses, where quality of water required is not very high. Water source should not be contaminated in any way.

Keep travel-generated garbage at the minimum. Composting, recycling and reduced pollution are what must be practiced. Proper disposal must only be at appropriate points along the route. Leave no eye-sores. 'Leave no trace' principle should be followed. Camping areas should be left cleaner than what you saw when you came. Remember that another party would be using the camp site after your departure. Differentiate between non-biodegradable and bio-degradable garbage. Burn or bury paper, natural refuse and litter. Keep non-biodegradable garbage for recycling and don't throw away plastic bags, foil, packets, glass bottles and metal cans.

State Water Policy

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and ground water resources, to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

The Himachal Pradesh Town and Country Planning Act, 1977: This is an Act to make provision for planning and development and use of land; to make better provision for the preparation of development and sectoral plans with a view to ensuring that town planning schemes are made in a proper manner and

their execution is made effective; to constitute the Town and Country and Development Authority for proper implementation of town and country development plan; to provide for the development and administration of special areas through the Special Area Development Authority; to make provision for the compulsory acquisition of land required for the purpose of the development plans and for connected purposes.

The Act mandates preparation of development plan, regional plan, sector plan and tourist development schemes.

A development plan shall consist of (i) space for residential, industrial, commercial or agricultural purposes; (ii) open spaces, parks and gardens, green belts, zoological gardens and play-grounds; (iii) lay down the pattern of National and State Highways connecting the planning area with the rest of the region, ring roads, arterial roads and the major roads within the planning area; (iv) project the requirement of the planning area of such amenities and utilities as water, drainage, electricity and suggest their fulfillment; (v) lay down the broad-based traffic circulation patterns in a city; (vi) indicate measures for flood control, prevention of air and water pollution, disposal of garbage and general environmental control.

The Himachal Pradesh Municipal Act, 1994: This Act seeks to consolidate and amend and replace the law relating to Municipalities in Himachal Pradesh. As per the provisions of Sub-section (1) of Section 47, the State Government shall, by notification, endow the Municipalities with such powers and authorities as may be necessary from time to time to enable them to function as institutions of Local Self Government with respect to: (i) the preparation of plans for economic development and social justice; (ii) the performance of functions and implementation of the schemes, which may be entrusted to them including (1) urban planning including town planning; (2) planning for economic and social development; (3) water supply for domestic, industrial and commercial purposes; (4) public health, sanitation conservancy and Solid Waste Management.

The Municipal fund shall be applicable to the payment in whole or in part, of the charges and expenses incidental to matters within the Municipal area and, with the sanction of the State Government, outside the municipal area, namely: (a) the construction, maintenance, improvement, cleansing and repair of all public streets, bridges, town-walls, town-gates, embankment, drains, privies, latrines, urinals, tanks and watercourses and the preparation of compost manure; the watering and lighting of such streets or any of them; and the supply, storage and preservation from pollution of water for the use of men or animal.

Provisions of drains, privies: (1) The municipality may, by notice, require the owner of any building or land to provide, move or remove any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse or, provide any additional drains, privies, latrines, urinals, cesspools or other receptacles as aforesaid, which should, in its opinion, be provided for the building or land, in such manner and of such pattern as the Municipality may direct; (2) The Municipality may, by notice, require any person employing more than twenty workmen or labourers to provide such latrines and urinals as it may think fit and to cause the same to be kept in proper order and to be daily cleaned; (3) The Municipality may, by notice, require the owner or occupier of any building or land to have any privy, latrine or urinal provided for the same shut out by a sufficient roof and wall fence from the view of persons passing by or dwelling in the neighbourhood or to remove or alter, as the Municipality may direct, any door or trapdoor of a privy, latrine or urinal opening on to any street or drain; and (4) The Municipality may, and when required by the State Government, shall provide latrines and urinals for the use of public.

Repair and closing of drains, privies: (1) The Municipality may, by notice, require the owner or occupier of any building or land to

repair, alter, or put in good order any drain, privy, latrine, urinal, cesspool or receptacle for any filth or refuse, or to close any drain, privy, latrine, urinal or cesspool belonging thereto; (2) The Municipality may, by notice, require any person, who has constructed any new drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse without its permission in writing or contrary to its directions or regulations or the provisions of this Act, or who has constructed, rebuilt or opened any drain, privy, latrine, urinal, cesspool or receptacle for filth or refuse, which it has ordered to be demolished or stopped or not to be made, to demolish the drain, privy, latrine, urinal, cesspool or receptacle to make such alteration therein as it may think fit.

Removal of latrines etc. near any source of water supply: (1) The Municipality may, by notice, require any owner or occupier on whose land any drain, privy, urinal, cesspool or other receptacle for filth or refuse for the time being exists within fifteen metres of any spring, well, tank, reservoir or other source from which water is or may be derived for public use, to remove or close the same within one week from the serving of such notice; (2) Whoever, without the permission of the Municipality, makes or keeps for a longer time than one week after notice under this Section any drain, privy, latrine, urinal, cesspool or other receptacle for filth or refuse, within fifty feet of any spring, well, tank, reservoir or any other source from which water is or may be derived for public use, shall be punishable with a fine, which shall not be less than twenty-five rupees and more than two hundred rupees and, when a notice has been issued, with a further fine of ten rupees for each day during which the offence is continued after the lapse of the period allowed for removal.

Prohibition by Municipality of use of unwholesome water: Should the Municipality, on the report of the Health Officer, consider that the water in any well, tank or other place is likely, if used for drinking, to endanger or cause the spread of any dangerous disease, it may *(a)* by public notice prohibit the removal or use of such water for drinking ; *(b)* by notice require the owner or person having control over such well, tank or place to take such steps as may be specified in the notice to prevent the public from having access to or using such water; or *(c)* take such steps as it may, on the advice of the Health Officer, consider expedient to prevent the danger of spread of any such disease.

The Himachal Pradesh Municipal Business Bye-Laws, 2006: The General Standing Committee shall perform functions relating to: (a) Establishment matters; (b) Communication of general nature; (c) Building regulations etc.; (d) Urban Housing Projects etc.; (e) Relief against natural calamities; (f) Water supply for the town; (g) to enquire and report on all matters relating to Municipal works, maintenance and verification of Municipal properties and nazul properties, roads and buildings under the control of the Municipality. It shall also supervise all Municipal works connected with buildings, road, drains etc.

The Municipal Medical Officer of Health shall be in charge of the Sanitation, Public Health and Health Departments of a Municipality. He shall supervise the sanitary conditions of all buildings and lands, burial and burning places, markets, slaughter houses, streets, drains sewerage, latrines, urinals, filth receptacles, cesspool, flushing appliances, farms, filth depots, dairies, milk shops, cow sheds, stables, meat shops and all shops dealing in edibles, bakeries, aerated water, factories, wells and *dhobi ghats* etc. He shall also check the house unfit for human habitation, offensive trades, foods and drinks, plants and stores.

The Municipal Engineer shall be in charge of the Engineering and Building Department. He shall be responsible for house connections of filtered water, supply system, road lighting, water metres, Municipal lands and properties, machinery, plants and stores and shall maintain registers and stock book laid down in the

Municipal Accounts Code and the Municipal Works Rules.

The Himachal Pradesh Housing and Urban Development Authority Act, 2004: An Act to re-enact the law to provide for the creation of a Development Authority to plan and develop land and create infrastructure to meet with the housing needs of different income groups and to provide for development schemes for mobilising public and private resources for the promotion of housing colonies and related infrastructure and to provide for the creation of appropriate authority and mechanism for planned development of housing colonies.

A development scheme may provide for (a) drainage, water-supply and lighting of the area included in the scheme; and (b) sanitary arrangements required for the area comprised in the scheme including the conservation and prevention of any injury or contamination to rivers or other sources and means of water supply.

The Himachal Pradesh *Panchayati Raj* Act, 1994: An Act to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act states framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the following functions: (a) mobilising voluntary labour and contribution in kind and cash for Community Welfare Programmes; (b) identification of beneficiaries for the implementation of developmental schemes pertaining to the village; and (c) rendering assistance in the implementation of developmental schemes pertaining to the village. In addition, it would:

- Approve plans, programmes and budget, prepared by the *Gram Panchayat* for economic development and social justice.
- Authorise, after being satisfied, issuance of utilisation certificate of funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

The Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995: This Act seeks to prevent throwing or depositing non-biodegradable garbage in public drains, roads and places open to public view and to regulate the use of non-biodegradable material in the State of Himachal Pradesh. The Act prohibits the throwing of degradable garbage in public drains and sewage and has provision for placement of receptacles and places for deposit of non-biodegradable garbage. It defines the duty of owners and occupiers to collect and deposit non-biodegradable garbage etc. and defines the power of local authority for removal of non-biodegradable garbage. It stresses on studies, research and support programmes.

Section 3 of this Act prohibits throwing of non-biodegradable garbage or bio-degradable garbage in non-biodegradable bag or container in any drain, ventilation shift, pipe and fittings, connected with the private or public drainage works. Section 4-A states about restriction or prohibition on use of certain things manufactured from non-biodegradable material. Section 4 states about making specific provision for placement of receptacles and places for deposit of non-biodegradable garbage.

The State Government has taken a cabinet decision to ban plastic altogether in the State with effect from 15th August 2009 under this Act.

The Himachal Pradesh Tourism Development and Registration Act, 2002: This is an Act to re-enact a law relating to registration of persons engaged in tourist trade, constitution of the Tourism Development Board and other matters connected therewith. This Act defines functions of Tourist Development Board under Section 8 of Chapter II.

Section 17, Chapter III of the Act states about the establishment and constitution of the 'Tourism Development Council' for a specific tourist place, as may be notified by the State Government. Section 21, Chapter III states that the function of the Council may include provision and maintenance of tourism related services, such as toilets, cleanliness of tourist spots, environmental upgradation etc.; assist the local body in maintaining sanitation and infrastructure facility at the tourist spots; regulate the construction, expansion, maintenance and operation of all tourism units and allied activities; prepare a Tourism Master Plan for its area; and all tourism units and establishments shall conform to the Master Plan.

Revised Policy on Development of Eco-Tourism in Himachal Pradesh, 2005: The Revised Eco-Tourism Policy aims to bring the wilderness of Himachal closer to the tourists visiting the State and, at the same time, attempts to put in place adequate safeguards and systems leading to the preservation of these natural resources.

The Policy states that ecological and environmental concerns would form an important component of the Tourism Master Plans for popular destinations. Revenues generated would be ploughed back for the maintenance and preservation of the environment. The Department of Forest would constantly evaluate the project and if it is found that Community Based Eco - Tourism (CBET) / Eco - Tourism norms and concepts are not being followed the project will be terminated forthwith.

The Government of Himachal Pradesh has constituted Tourism Development Council for Shimla and Mandi under Himachal Pradesh Tourism Development and Registration Act, 2002. The functions of Tourism Development Council are to provide and maintain tourism related services; assist the local body in maintaining infrastructural facilities at tourist spots; build and maintain tourism and recreational facilities, which may enhance the tourism value of the area; prepare Tourism Master Plan for the area; and maintain and operate a Tourism Destination Fund.

The Council can also raise resources for the development of infrastructure and facilities by way of fees, cess etc. However, Tourism Destination Fund has yet not been established for Shimla.

Besides, Tourism Development Council, for Manali and Kullu district has also been constituted vide Notification No. TSM F3-2/2003-I dated 7.7.2004.

The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act No. 32 of 1976): This Act seeks to provide for the preservation of ancient and historical monuments, archaeological sites and remains, other than those of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.

Section 16 of this Act states about the protection of places of worship from misuse, pollution or desecration. A protected monument maintained by the Government under this Act, which is a place of worship or shrine, shall not be used for any purpose inconsistent with its character.

Other Sub-programmes/ Strategies

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding) Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance, Government of India.In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria:

(a) The project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the empowered committee may relax this eligibility criterion.

(b) International Convention Centres and other tourism infrastructure projects; provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, provide additional grants out of its budget, but not exceeding a further twenty percent of the total Project Cost. Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 *crores* (Rs. One Hundred *Crores*) for each project may be sanctioned by the Empowered Committee subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *Crores* (Rs. Two Hundred *Crores*) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 *Crores* may be sanctioned by the Empowered Committee with the approval of Finance Minister.

Rural Tourism Infrastructure Development: Under this Scheme, thrust will be to promote village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions.

Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be to tap the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/ Departments of the Government of India.

Revised Scheme of Assistance for Large Revenue Generating Projects, Government of India: The projects promoted by public sector undertakings, agencies, or autonomous bodies of Central/State Governments as well as projects promoted by Private Sector/PPP Projects recommended by the State Governments / Union Territory Administrations will be eligible for assistance.

The projects selected for assistance under this scheme would not be eligible for subsidy from other schemes of the Central or State Governments. Similarly, the projects which have already availed subsidy/financial assistance from any other scheme of the Central or State Governments, would not be eligible for Government of India assistance under this scheme.

A Special Purpose Vehicle (SPV) would have to be set up by the implementing partners in case a private party is promoting the project on its own or in PPP mode, prior to the consideration of their project under this scheme. However, where the promoter of the project is a State PSU, agency, autonomous body or Central Government PSU, agency or autonomous body, a separate SPV need not be required. In both the cases, a separate project management group would be required.

Grant-in-aid for the preparation of DPR would be admissible at 50 percent of the actual

cost subject to a maximum of Rs. 25 *lakhs* per project. No Grant-in-aid would be admissible for preparation of feasibility report.

The subsidy under the scheme will have a cap of Rs. 50 *crores* subject to a maximum of 25 percent of total project cost or 50 percent of equity contribution of the promoters, whichever is lower.

Central Rural Sanitation Programme (Total Sanitation Campaign): The concept of sanitation was earlier limited to disposal of human excreta by cess pools, open ditches, pit latrines, bucket system etc. Today, it connotes a comprehensive concept, which includes liquid and solid waste disposal, food hygiene, personal, domestic as well as environmental hygiene. The concept of sanitation was, therefore, expanded to include personal hygiene, home sanitation, safe water, garbage disposal, excreta disposal and waste water disposal.

The 'Total Sanitation Campaign' (TSC) emphasises more on Information, Education and Communication (IEC), Human Resource Development, Capacity Development activities to increase awareness among the rural people and generation of demand for sanitary facilities.

The main objectives of the TSC are as follows:

Bring about an improvement in the general quality of life in the rural areas; accelerate sanitation coverage in rural areas; generate felt demand for sanitation facilities through awareness creation and health education; cover schools/*Anganwadis* in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students; encourage cost effective and appropriate technologies in sanitation; eliminate open defecation to minimise the risk of contamination of drinking water sources and food; convert dry latrines into pour flush latrines; and eliminate manual scavenging practice, wherever in existence in rural areas.

Implementation of TSC is proposed on a project mode. A project proposal emanating from a district is scrutinised by the State Government and transmitted to the Government of India (Department of Drinking Water Supply, Ministry of Rural Development). TSC is implemented in phases with start-up activities. Funds are made available for preliminary IEC work. The physical implementation gets oriented towards satisfying the felt-needs, wherein individual households choose from a menu of options for their household latrines.

Jawahar Lal Nehru Urban Renewal Mission (JNNURM): JNNRUM was launched in the month of December, 2005 for developing basic urban infrastructure and urban slum development in 63 cities of India.

The objectives of JNNURM are to assist cities achieve focused attention to Integrated development infrastructure services and meet the deficiencies in infrastructure projects; and secure effective long term sustainability of projects by establishing linkages between asset creation and management through reforms, so that the infrastructural services created in the cities are not only maintained efficiently, but also become self-sustaining over time.

The duration of the Mission is seven years starting from the year 2005-06 and on its completion, it is expected that the cities would have achieved: Modern and transparent budgeting, accounting, financial management systems, designed and adopted for all urban services and governance functions; city wide framework for planning and governance will be established and become operational; all urban residents will be able to obtain access to a basic level of urban services; financially self sustaining agencies for urban governance and service delivery will be established through reforms to major revenue instruments; local services and governance will be conducted in a manner that is transparent and accountable to citizens; and E-governance applications will be introduced in core functions of ULB/para-statal resulting in reduced cost and time of

service delivery. The Mission encourages the leveraging of funds available under JNNURM assistance by enhancing the resource availability with ULBs/para-statal, commercial viability of projects and bankability of the projects and incorporating Private Sector efficiencies in development, financing, implementation and management of projects.

Urban Renewal includes redevelopment of inner (old) city areas (this would include items like widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner-city) areas to conforming (outer-city) areas to reduce congestion; replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/drainage/solid waste disposal system etc. Land acquisition cost will not be financed under this component of the programme. Water supply including setting up de-salination plants, where necessary; sewerage and solid waste management; construction and improvement of drains/storm water drains; urban transport; laying/improvement/widening of arterial/sub-arterial roads and bridges to remove transport bottlenecks; laying of ring roads and by-passes around metro and mega cities, provided certain cost recovery measures like toll charges are built in; construction and development of bus and truck terminals; environmental improvement and city beautification schemes; construction of working women hostels, marriage halls, old age and destitute Children's homes, night shelters with community toilets.

For special category States like Himachal Pradesh, the pattern of funding is 80 percent by the Government of India, 10 percent by the State Government and 10 percent by local Municipality.

Under JNNURM scheme, Shimla town has been covered for under taking different activities. These activities include setting up of Solid Waste Management facility; infrastructure improvement of Shimla city; rehabilitation of water supply distribution system for Shimla city; and rejuvenation of sewerage network in missing lines and left out areas.

Rajiv Gandhi Urban Renewal Facility (RGURF): This scheme seeks to strengthen the urban infrastructure and achieve clean environment in urban areas of the State. This scheme was launched in 2006-07 for infrastructure and sanitation improvement in all urban areas of the State other than Shimla. The main objectives of the scheme are infrastructure and sanitation improvement in all urban areas of the State.

The main components of the scheme are: a) Management of Urban Solid Waste; b) Parking lots within the towns for cars etc. and on the fringe of the town for trucks. The truck parking facilities shall also integrate the workshops, *dhabas* and other eateries, common civic amenities etc. The land for such parking lots shall have to be provided by the Local Bodies and the State Government shall not make any provision for cost of land; c) Setting up of new public amenities by way of community toilets within the existing towns, especially in the proximity of bus stands, hospitals, main shopping areas etc. The new community toilets shall be on a lease/contract basis with M/s Sulabh International, who already has its presence in the State; and d) Development of parks within the existing towns. The Urban Local Bodies shall get detailed project report prepared for each proposal. The cost of Detail Project Reports could also be an integral part of the overall project cost and its funding.

The funds will be provided to Municipal Council/*Nagar Panchayat* on 'first come first served' basis as 95 percent Government Grant of total cost of Detail Project Report and remaining five percent is to be borne by the Municipality out of its own resources under Rajiv Gandhi Urban Renewal Facility (RGURF) for infrastructure and sanitation improvement in urban areas. During current financial year 2010-11, there is a budgetary provision of Rs. 671.00 *lakhs* under this

scheme for infrastructure and sanitation improvement in urban areas.

Environmental Improvement of Urban Slums (E.I.U.S): Environmental Improvement of Urban Slums (E.I.U.S./National Slum Development Programme (HSDP) was launched in Himachal Pradesh during 1982-83 and was being implemented by the Town and Country Planning Department till 1998-99. The scheme had been transferred to the Directorate of Urban Development during the year 1999-2000 for further implementation. This programme falls under Special Component Plan (SCP) on which 50 percent budget is being utilised every year.

The aims and objectives of the scheme are to improve the environmental condition of 2.50 *lakhs* slum dwellers living in 374 slum pockets in 49 Urban Local Bodies of the State. This is being carried out by way of providing community facilities, such as Path, Drain, *Raen Baseras* (night shelters), Toilets, Street Lights, Parks, Roads and Storm Water Drains (Gutters) etc. to benefit the slum population of the Himachal Pradesh.

The State scheme shall first get sanctioned in a State level Project Committee, which shall be set up for this purpose by the concerned State Government and shall have one representative from the Department of Urban Employment & Poverty Alleviation, Government of India, which is the nodal Department for this scheme.

At the district level, the Deputy Commissioner of the district, monitors quarterly progress under this programme; at the State level, the State Government monitors the progress under this programme; and at National Level, the Department of Urban Development and Poverty Alleviation of Government of India monitors the progress under this programme.

The funds for this scheme are being received through State Plan Budget under head 2217-Urban Development. The Social Justice and Empowerment Department has been declared as administrative Department for the implementation of this scheme under Scheduled Caste Sub-Plan of the State Budget.

During the year 2009-10, Rs 244.00 *lakhs* were released to the ULBs under *Environment Improvement of Urban Slum (EIUS)* scheme to benefit 3300 BPL families by providing basic amenities and infrastructure, viz. community taps, hand pumps, street lights, community bathrooms and latrines, road pavements, sewerage and storm water drainage, *Raen Baseras* etc. in slum areas. There is a budget provision of Rs. 294.00 *lakhs* to benefit 3600 slum families in the current financial year 2010-11 under this scheme.

Integrated Housing and Slum Development Programme (IHDSP): This scheme was launched on 3rd December, 2005. The basic objective of the scheme is to strive for slum less cities by adopting holistic slum development with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities to the slum dwellers of the identified urban areas.

The components for assistance under the scheme will include all slum improvement / upgradation / relocation projects including upgradation/new construction of houses and infrastructural facilities; provision of shelter including upgradation and construction of new houses; provision of physical amenities like community toilets; water supply and sewerage, storm water drains, community bath, widening and paving of existing lanes, sewers, street lights etc. The cost of land for such projects will not be provided under the programme and has to be borne by the State Government. In case the project is to be undertaken on the private land, which is to be acquired by the State, the cost of land may also be part of the project costing only in the case of North Eastern States and the hilly States of Himachal Pradesh, Uttaranchal and Jammu and Kashmir.

The scheme will apply to all towns and cities excepting cities/towns covered under

JNNRUM. Allocation of funds among States will be on the basis of the State's urban slum population to total urban slum population in the country. The funds will be provided only to those towns and cities where election to the local bodies have been held and elected bodies are in position. The sharing pattern for the hilly State like Himachal Pradesh is 80 percent by the Central Government, 10 percent by the State Government and the remaining 10 percent by the financial institutions.

Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSMT): In December, 2005, the Government of India launched a new scheme, namely, Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSMT) by subsuming the existing schemes of IDSMT (Integrated Development of Small and Medium Towns) and AUWSP (Accelerated Urban Water Supply Programme). Admissible Components include: Urban Renewal, i.e., redevelopment of inner (old) city areas, which includes widening of narrow streets, shifting of industrial/commercial establishments from non-conforming (inner city) to conforming (outer city) areas to reduce congestion, replacement of old and worn-out water pipes by new/higher capacity ones, renewal of sewerage/ drainage/solid waste disposal systems etc.; water supply (including de-salination plants) and sanitation; sewerage and Solid Waste Management; construction and improvement of drains/storm water drains; parking lots/spaces on Public Private Partnership basis; preservation of water bodies. The Project is to be prepared by the ULBs with 80 percent Central share, 10 percent State share and 10 percent ULBs share. Government of Himachal Pradesh has declared HIMUDA as the nodal agency for the preparation and execution of the UIDSMT Scheme.

The Nodal agency will be responsible for*:* Inviting project proposals from ULBs/para-statal/implementing agencies; techno-economic appraisal of the projects either through in-house expertise or by outside agencies through outsourcing; management of funds received from Central and State Governments; disbursement of the funds; furnishing of utilisation certificates within 12 months of the closure of the financial year and quarterly physical and financial progress reports to the Ministry of Urban Development; maintenance of audited accounts of funds released to the ULBs and implementing agencies; and monitoring of implementation of reforms and infrastructure projects.

It is mandatory that before the project is submitted for approval to the GoI, the State Government and ULBs will have to accept implementation of agenda of reforms. The proposed reforms shall broadly fall in two categories: a) Mandatory reforms by the State and the ULBs; b) Optional reforms by the State and the ULB.

National Lake Conservation Plan (NLCP), 2001: Recognising the importance of lakes, Ministry of Environment and Forests, Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The scheme was approved by the Government of India during the IX Plan (June 2001) as 100 percent Central Grant. Funding pattern under NLCP has since been changed, w.e.f. February, 2002, from 100 percent Central funding to 70:30 cost sharing between the Central and the concerned State Governments.

The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country degraded due to waste water discharge into the lake and other unique freshwater ecosystems through an integrated ecosystem approach. Unique fresh water ecosystems cover lakes that are unique entities of incomparable values and need to be preserved and conserved, e.g., high altitude lakes, like the Lonar lake Maharashtra etc.

Health Vision, 2008: The Health Vision, 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the

strategy and tactical tools for attainment of targets. The primary goal of Vision 2008 is to achieve the status - Health for All.

Roadmap 2008 document also mentions that as part of good governance practices, the State shall initiate and strengthen existing system to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.

Rural Tourism Infrastructure Development Scheme: Under this Scheme, thrust will be to promote village tourism as the primary tourism product to spread tourism and its socio-economic benefits to rural and new geographic regions. Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance, the focus would be to tap the resources available under different schemes of Ministry of Rural Development, State Government and other Ministries/Departments of the Government of India.

The Technical Guidance Manual of Common Municipal Solid Waste Management Facilities, IL&FS and MoEF, 2010: The manual describes types of EIA; process and pollution control technologies; operational aspects of EIA with model ToR of that Sector; technological options with cleaner production; monitoring of environmental quality; post clearance monitoring protocol; related regulations; and procedure of obtaining Environmental Clearance.

2.12 Hazardous Waste

The Policies and Laws applicable and/or related to State's waste disposal (MSW/Hazardous Waste) sector development, along with a brief description of their relevance, are listed below. Detailed explanations can be acquired from the websites of relevant Departments, line Ministries, like the Ministry of Environment and Forests (www.envfor.nic.in), Ministry of Commerce and Industries (http://commerce.nic.in/), and Ministry of Mines (http :// mines. nic. in), Department of Industries, Himachal Pradesh (http: // himachal. gov.in/ industry/ welcomelat.htm) and its Geology and Mining wing (http:// himachal.nic. in/industry/ mining. htm) and HP Pollution Control Board (http://hppc.nic.in).

National Level Policies/ Regulations

Constitution of India, Mineral Regulation: Ownership of the minerals rests with the State and the Central Government is required to regulate the mines and minerals development to the extent declared in accordance with Entry 54 in the Union List of the Seventh Schedule of the Constitution. The power of the States to regulate mines or minerals development is subject to Entry 23, List II State List in the Seventh Schedule.

The National Environment Policy (NEP), 2006: Section 5.1.3 on Substantive Reforms of NEP states that Environmental Impact Assessment (EIA) will continue to be the principal methodology for appraising and reviewing new projects. The assessment processes are under major revision in line with the Govindarajan Committee recommendations. Under the new arrangements, there would be significant devolution of powers at the State / Union Territories levels. However, such devolution, to be effective, needs to be accompanied by adequate development of human and institutional capacities. Further, in order to make the clearance processes more effective, the following actions will be taken: Point (d) of Section 5.1.3 states, "Encourage clustering of industries and other development activities to facilitate setting up of environmental management infrastructure as well as monitoring and enforcing environmental compliance. Emphasise post project monitoring and implementation of environmental management plans through

participatory processes, involving adequately empowered relevant levels of Government, industry, and the potentially impacted community." Further, Point (g) seeks to ensure provision for environmental restoration after decommissioning of industries, in particular, mine closure in all approvals of mining plans, and institutionalise a system of post-monitoring of such projects.

Section 5.2.10 of NEP on Climate Change, Point (g) states, "Encourage Indian Industry to participate in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects, including in the financial sector."

Section 5.3.1 on Environmental Standards states, "Encourage Indian Industry to participate in the Clean Development Mechanism (CDM) through capacity building for identifying and preparing CDM projects, including in the financial sector." It suggests following specific actions: a) Set up a permanent machinery comprising experts in all relevant disciplines to review notified ambient and emission standards in the light of new scientific and technological information as they become available, and changing national circumstances, ensuring adequate participation by potentially impacted communities, and industry associations. b) Strengthen the testing infrastructure and network for monitoring ambient environmental quality, including through participation by local communities, and Public Private Partnerships (PPPs). Progressively ensure real-time and on-line availability of the monitoring data.

Section 5.4 on Clean Technologies and Innovation suggests actions like a) **e** ncourage capacity building in the financial sector for appraising clean technology switchover project proposals; b) set up a mechanism to network technology research institutions in the country, public and private, for cooperation in technology research and development and adaptation, information, and evaluation of clean technologies. Create a database of such technologies, and promote dissemination of new technologies developed both in India and abroad; c) consider the use of revenue enhancing fiscal instruments to promote shifts to clean technologies in both existing and new units; and d) promote adoption of clean technologies by industry, in particular, in the small and medium sector, through regulatory and fiscal measures, and standards setting.

Section 5.6 on Partnerships and Stakeholder Involvement states that the conservation of the environment requires the participation of multiple stakeholders, who may bring to bear their respective resources, competencies, and perspectives, so that the outcomes of partnerships are superior to those of each acting alone. Implementing and policy making agencies of the Government, at Central, State, Municipal, and *Panchayat* levels; the legislatures and judiciary; the public and private corporate sectors; financial institutions; industry associations; academic and research institutions; independent professionals and experts; the media; youth clubs; community based organisations; voluntary organisations; and multilateral and bilateral development partners, may each play important roles in partnerships for the formulation, implementation, and promotion of measures for environmental conservation.

The National Water Policy, 2002: This National level Policy addresses the water issues including prioritisation, allocation, pricing and inter-State issues related to water sharing. Policy states about the use of water, water conservation and quantification of water pollution.

Industrial Policy: The main objectives of the Industrial Policy of the Government of India are to maintain a sustained growth in productivity; to enhance gainful employment, to achieve optimal utilisation of human resources to attain international competitiveness; and to transform India into a major partner and player in the global arena. The Industrial Policy focuses on deregulating Indian industry; allowing the industry freedom and flexibility in responding to market forces;

and providing a Policy regime that facilitates and fosters the growth of the Indian industry.

Some of the important Policy measures announced and procedural simplifications undertaken to pursue the Policy objectives are: liberalisation of Industrial Licensing Policy; ii) introduction of industrial Entrepreneurs' Memorandum (EM); liberalisation of the Locational Policy; Policy for small scale industries; Non-Resident Indians scheme; Electronic Hardware Technology Park (EHTP)/Software Technology Park (STP) scheme, Policy for Foreign Direct Investment (FDI).

National Health Policy, 2002: The main objective of this National Policy is to achieve an acceptable standard of good health amongst the general population of the country. It proposes an approach to increase access to decentralised public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions.

The Policy hoped that the independently stated Policies and Programmes of the environment related sectors should be smoothly interfaced with those of the health sector in order to reduce the health risk to the citizens and the consequential disease burden.

This policy welcomes the participation of the Private Sector in all areas of health activities – primary, secondary and tertiary. The policy recognises the significant contribution made by NGOs and other institutions of the Civil Society in making available health services to the community. It also emphasises the need to simplify procedures for Government – Civil Society interfacing in order to enhance the involvement of Civil Society in public health programmes.

National Action Plan on Climate Change (NAPCC), 2008: National Action Plan on Climate Change (NAPCC), 2008 has been prepared by the Government of India. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of climate change impact through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for "Green India", (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

The Foreign Trade Policy, 2009-2014 (FTP): In exercise of powers conferred by Section 5 of the Foreign Trade (Development and Regulation) Act,1992 (No. 22 of 1992) read with paragraph 1.2 of the Foreign Trade Policy, 2009-2014, the Central Government hereby notifies the Foreign Trade Policy, 2009-2014 as contained in Annexure to this Notification. The Policy shall come into force w.e.f. 27 th August, 2009. The FTP incorporates provisions relating to export and import of goods and services shall come into force with effect from 27th August, 2009 and shall remain in force up to 31st March,2014unless otherwise specified. All exports and imports up to 26th August, 2009 shall be accordingly governed.

The special focus of FTP on Agriculture and Village Industry is on (a) *Vishesh Krishi and Gram Udyog Yojana* (VKGUY) (b) Capital goods imported under EPCG will be permitted to be installed anywhere in AEZ. (c) Import of restricted items, such as panels, is allowed under various export promotion schemes. (d) Import of inputs, such as pesticides are permitted under Advance Authorisation for agro exports. (e) New towns of export excellence with a threshold limit of Rs 150 *crores* shall be notified. And, (f) Certain specified flowers, fruits and vegetables are entitled to a special duty credit scrip in addition to the normal benefit under VKGUY.

Green Products and Technologies: India aims to become a hub of the production and export of green products and technologies. To

achieve this objective, special initiative will be taken to promote development and manufacture of such products and technologies for exports. To begin with, focus would be on items relating to transportation, solar and wind power generation and other products as may be notified, which will be incentivised under Reward Schemes.

National Policy on Resettlement and Rehabilitation, 2007: It is applicable when more than a defined number of families are displaced for a project. The threshold is 400 or more Displaced Families (DF) *en masse* in plains and 200 or more DF in tribal or hilly areas, Desert Development Programme (DDP) blocks or areas under Schedule V and VI to the constitution of India.

National Mission for Sustaining the Himalayan Ecosystem: The plan aims to conserve biodiversity, forest cover and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming.

National Mission for "Green India": Goals include the afforestation of six million hectares of degraded forest lands and expanding forest cover from 23 to 33 percent of India's territory.

The Environment (Protection) Act, 1986: It is a comprehensive legislation on environment that empowers the Central Government to take appropriate measures for the purpose of protecting and improving the environment. It provides for laying down standards for controlling emissions and effluent discharges of environmental pollutants; to regulate industrial locations; to prescribe procedures for managing hazardous substances; to establish safeguards for preventing accidents; and to collect and disseminate information regarding environmental pollution. In accordance with this Act, the Central Government has issued a number of regulations affecting sectors, such as hazardous and chemical wastes, genetically engineered micro-organisms and industrial development of coastal zones.

Section 3 (1) of the Act empowers the Centre to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution. The Central Government is empowered by this Act to set new national standards for the quality of the environment as well as standards for controlling emissions and effluent discharges; to regulate industrial locations; to prescribe procedure for managing hazardous substances; to establish safeguards for preventing accidents; and to collect and disseminate information regarding environment pollution. Section 23 of the Act empowers the Centre to delegate its powers and functions to any officer, State Government or any authority. According to Section 15, any case of non-compliance or contravening any of the provisions of this Act, or the Rules made or orders or directions issued there under, will be punishable with imprisonment for a term, which may extend to five years or with fine, which may extend to Rs. One *Lakh*, or with both, and in case the failure or contravention continues, with an additional fine, which may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention. If the failure or contravention referred to in Sub-section 15 (1) continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term, which may extend to seven years.

Environment (Protection) Rules, 1986: The Environment (Protection) Rules, 1986 were notified vide S.O.844 (E), [19/11/1986]. The powers conferred by the Environment Protection Act, 1986 are followed under the heads of Coastal Regulation Zone; Delegation of Powers; Eco-marks Scheme; Eco-sensitive Zone; Environmental Clearance – General; Environmental Labs; Environmental Standards; Hazardous Substances Management; Loss of Ecology; Noise

Pollution; Ozone Layer Depletion; Water Pollution; and 2-T Oil.

Environment (Siting for Industrial Projects) Rules, 1999, Environment (Protection) Act, 1986: Under clause (v) of Sub-section (2) of Section 3, Sub-section (1) of Section 6 and Section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with Rule 5 of the Environment (Protection) Rules, 1986 the Central Government made rules for siting Industrial Projects, namely Environment (Siting for Industrial Projects) Rules, 1999. The said Rules prohibit setting up of certain industries. It specifies four conditions, namely, (a) No new unit of the industries listed in Annexure-I shall be allowed to be set up in the entire area within the Municipal limits of all Municipal Corporations, Municipal Councils and *Nagar Panchayats* (by whatever name these are known in each State) and a 25 km belt around the cities having population of more than one million. (b) Seven km belt around the periphery of the wetlands listed in Annexure-II. It is to be noted that no wetlands in Himachal Pradesh is listed in Annexure II. (c) 25 km belt around the periphery of National Parks, Sanctuaries and core zones of biosphere reserves; and (d) 0.5 km wide strip on either side of National Highways and rail lines.

The Rules provide for the establishment of New Units with certain conditions: Establishment of new units of the industries listed in Annexure-I shall be allowed in seven to 25 km belt around the periphery of the wetlands listed in Annexure-II only after careful assessment of their adverse ecological and environmental impacts. Further, Rules provide for the establishment of New Units around Archaeological Monuments. It stipulates that new units of industries listed in Annexure-III shall not be allowed to be set up within seven km periphery of important archaeological monuments listed in Annexure-IV. No monument from Himachal Pradesh is listed in Annexure IV.

The Environment (Protection) Fifth Amendment Rules, 2008: The Rules defined parameters for emissions from Common Hazardous Waste Incinerator, namely, Particulate matter, HCl, SO_2, CO, Total Organic Carbon, HF, NOx (NO and NO_2 expressed as NO_2), Total dioxins and furans, Cd + Th + their compounds, Hg and its compounds, Sb + As + Pb + Co + Cr + Cu + Mn + NI + V + their compounds.

Environment (Protection) Seventh Amendment Rules, 2008: The Amendment sets emission standards for Incinerator for Pesticide Industry, namely, Particulate Matter, HCl, SO_2, CO Total Organic Carbon, Total Dioxins and Furans (Existing Incinerator and New Incinerator), Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + their compounds.

The Amendment sets standards for Wastewater as following: (i) Wastewater (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollutions (Part A: Effluents) notified under the Environment (Protection) Rules, 1986. (ii) The built up in Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/I over and above the TDS of raw water used.

Environment (Protection) Eighth Amendment Rules, 2008: The Amendment, is made in the Environment (Protection) Rules, 1986, in Schedule I (a) in serial number 94 relating to 'Noise Limit for Generator Sets Run with Diesel', in paragraph 3.2. (i) for the words, 'every manufacturer or importer (hereinafter referred to as 'supplier'), every manufacturer or assembler or importer (hereinafter referred to as the 'manufacturer') shall be substituted; (ii) for the words 'manufactured or imported', the words 'manufactured or assembled or imported' shall be substituted.

Transportation of Diesel Generator Sets (above 250 KVA): For the transportation of diesel sets (above 250 KVA), the following guidelines need to be observed:

a. Diesel Generator set shall be transported after fulfilling the requirement of certification specified in paragraph 3.2 as a complete unit with acoustic enclosure, or dismantled, with relevant genset number specified on acoustic enclosure and silencer for reassembling at the site of its operation.
b. Compliance with the noise norms shall be monitored after reassembling the D.G. set at the location of the installation by the concerned State Pollution Control Board or, as the case may be, by the Union Territory Pollution Control Committee.

Environment (Protection) Second Amendment Rules, 2009: The Amendment is made in the Environment (Protection) Rules, 1986, in Schedule I, in serial number 73 relating to Pharmaceuticals Industry (Bulk Drugs). The Rules define parameters for emission from Incinerator namely Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans, Existing Incinerator, New Incinerator Sb + As + Cr + Cp + Ci + Mo + V + Cd + Th + Hg and their compounds.

Parameters for effluent from Incinerator: (i) Effluent from scrubber(s) and floor washing shall flow through closed conduit/pipe network. (ii) Storm water shall not be allowed to mix with scrubber water and or floor washings. (iii) Storm water shall be channelised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall. (iv) The build-up of Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/l over and above the TDS of raw water used. (v) Effluent shall not be stored in holding tank(s) in such manner, which may cause pollution to groundwater. (vi) Effluent (scrubber water and floor washings) shall be discharged into receiving water conforming to the norms prescribed under Schedule VI: General Standards for Discharge of Environment Pollutions (Part A: Effluents) notified under the Environment (Protection) Rules, 1986.

Environment (Protection) Amendment Rules, 2009: In the Environment (Protection) Rules, 1986, Amendment is made in Schedule I for Refractory Industry. The Rules define: A. Emission Standards for (i) Down Draft Kiln Category, namely, Particulate matter and Stack height (ii) Other than (Fuel: Coal) Particulate matter, Stack height, (iii) Box, Tunnel, Down Draft Kiln etc. (Fuel: Natural Gas/Producer Gas/LPG or a combination of Fuels/Furnace Oil as Secondary Fuel), Particulate matter, Stack height, (iv) Rotary Kiln Category, Particulate matter, Stack height, Small medium large category - Small rotary kiln, medium kiln, large rotary kiln. B. Effluent Standards for parameters pH, Oil and grease, Biochemical Oxygen Demand (3 days, 27° C Temperature), Chemical Oxygen Demand, Suspended Solids, phenols, Cyanide as CN, Cr (hexavalent) and Cr (total) for Inland surface water, public sewer and land for Irrigation.

Environment (Protection) (Sixth Amendment) Rules, 2010: The Rules regulate (a) Iron Ore Mining and Ore Processing and set emission Standards for Stack for De-dusting Unit Particulate matter Stack height; (b) Fugitive Emission Standards for Particulate matter: Fugitive emission shall be monitored in the predominant downwind direction at a distance of 25.0 + 2.0 metres from the source of fugitive emission as per the following guidelines:

Area: Mine Face/Benches and Monitoring location, namely: Drilling, excavation and loading applicable for operating benches above water table,
Area: Haul Roads/Service Roads and Monitoring location, namely: Haul roads to ore processing plant, waste dumps and loading areas and service road
Area: Crushing Plant and Monitoring location, namely: Run-off mine unloading at hopper, crushing areas, screens and transfer points.

Area: Screening Plant and Monitoring location, namely: Screens, conveying and transportation of ore discharge points.
Area: Ore Storage and Loading and Monitoring location, namely: Intermediate stock bin/pile areas, ore stock bin/pile areas, wagon/truck loading areas
Area: Waste dump and Monitoring location, namely: Active waste/reject dumps
(c) Effluent Standards defined for pH, Suspended solids (non-rainy day), Suspended solids (rainy day), and Oil and grease.

Environment (Protection) (Second Amendment) Rules, 2010: The Amendment in the Rules regulate Plaster of Paris Industry: A Production Capacity up to 30 tonnes per day (TPD), Stack Emission Standards defined for particulate matter from Crusher, Calciner, Furnace and Grinder. Production Capacity above 30 tonnes per day (TPD), Stack Emission Standards defined for Particulate matter from Crusher, Calciner, Furnace and Grinder,

Environment (Protection) (Third Amendment) Rules, 2010: The Amendment is made for serial number 8 and the entries relating thereto. The following serial number and entries shall be substituted, namely, the Dye and Dye Intermediate Industry.
A. Effluent Standards for parameters
pH, Suspended Solids, for parameters Biochemical Oxygen Demand (3 days, 27ºC Temperature), Colour, Mercury (as Hg), Chromium (as Cr_6), Chromium (Total Chromium as Cr), Copper (as Cu), Zinc (as Zn), Nickel (as Ni), Lead (as Pb), Manganese (as Mn), Cadmium (as Cd), Chloride (as Cl), Sulphate (as SO_4), Phenolic Compounds (as C_6H_5OH), Oil and Grease and Bioassay Test.

B. Emission Standards for Incinerator, namely: Particulate Matter, HCl, SO_2, CO, Total Organic Carbon, Total Dioxins and Furans.
Existing Incinerator/New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds.

C. Effluent Standards for Incinerator:

1. Effluent from scrubber(s) and floor washing shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mentioned at 'A' above.
2. The built up of Total Dissolved Solids (TDS) in wastewater of floor washings shall not exceed 1000 mg/l over and above the Total Dissolved Solids of raw water used.

D. Storm water:

(i) Storm water shall not be allowed to mix with scrubber water and/or floor washings.
(ii) Storm water shall be channelised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall.

Environment (Protection) (Fourth Amendment) Rules, 2009: In the Environment (Protection) Rules, 1986, in ScheduleI,forserialnumber74relatingto 'Emission Standards for Brick Kilns' and entries relating thereto, the following serial number and entries shall be substituted, namely: Brick Kilns' emission standard for: i) Bull's Trench Kiln (BTK) for Particular matter, Stack height, (ii) Down Draft Kiln (DDK) Particular matter and Stack height, (iii) Vertical Shaft Kiln (VSK) Particular matter and Stack height,

Environment (Protection) (Fourth Amendment) Rules, 2010: In the Environment (Protection) Rules, 1986, in Schedule-I, in serial number 68 and the entries relating thereto, the following serial number and entries shall be substituted for Organic Chemicals Manufacturing Industry Effluent Standards:

A. Effluent standards for parameters such as: pH, Biochemical Oxygen Demand (3 days, 27ºC temperature) Oil & Grease Bioassay test + Nitrate (as N), Arsenic (as As), Chromium (Hexavalent), Chromium, Lead (as Pb),

Cyanide (as CN), Zinc (as Zn), Mercury (as Hg), Copper (as Cu), Nickel (as Ni), Phenolics (as C_6H_5OH) and Sulphide.

B. Emission Standards for Incinerator: Limiting concentration in mg/Nm^3, unless otherwise stated Particulate Matter HCl, SO_2 CO Total Organic carbon, Total Dioxins Existing, and Furans* Incinerator New Incinerator Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + Cd + Th + Hg and their compounds.

C. Effluent Standards for Incinerator: (i) Effluent from scrubber(s) and floor washing shall flow through closed conduit or pipe network and be treated to comply with the effluent standards mentioned at 'A' above, (ii) the built up of Total Dissolved Solids (TDS) in waste water of floor washings shall not exceed 1000 mg/I over and above the Total Dissolved Solids of raw water used.

D. Storm water: (i) Storm water shall not be allowed to mix with scrubber water and/or floor washings. (ii) Storm water shall be channelised through separate drains passing through a HDPE lined pit having holding capacity of 10 minutes (hourly average) of rainfall".

Environment (Protection) (Fifth Amendment) Rules, 2010: The Amendment in the Environment (Protection) Rules, 1986, is made in Schedule I at serial number 55 relating to 'Common Effluent Treatment Plants: B. Treated Effluent Quality of Common Effluent Treatment Plant' at parameter relating to 'Oil and Grease' (Concentration in mg/l) for disposal into Marine Coastal areas, for the figure '20', the figure '10' shall be substituted. Further, the Amendment is made in Schedule VI relating to General Standards for Discharge of Environmental Pollutants, Part A: Effluents at serial number 7 at parameter relating to 'Oil and Grease' (mg/I max.), in column number 3 (d) for the figure '20', the figure '10' shall be substituted.

Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989.

These rules shall apply to, -

(a) an industrial activity in which a hazardous chemical, which satisfies any of the criteria laid down in Part I of Schedule 1 [2][or listed] in Column 2 of Part II of this Schedule is, or may be, involved; and

(b) isolated storage of a hazardous chemical listed in Schedule 2 in a quantity equal to or more than the threshold quantity specified in Column 3, thereof.

(1) Rules 7 to 15 shall apply to, -

(a) an industrial activity in which there is involved a quantity of hazardous chemical listed in Column 2 of Schedule 3 which is equal to or more than the quantity specified in the entry for that chemical in Column 3 & 4 (Rules 10-12 only for Column 4); and

(b) isolated storage in which there is involved a quantity of a hazardous chemical listed in Column 2 of Schedule 2 which is equal to or more than the quantity specified in the entry for that chemical in Column [3][3 & 4 (rules 10-12 only for column 4).]

(2) For the purpose of rules 7 to 15,

(a) "new industrial activity" means an industrial activity which, –

(i) commences after the date of coming into operation of these rules; or

(ii) if commenced before that date, is an industrial activity in which a modification has been made which is

[2] Substituted by Rule 3(i) of the MSIHC (Amendment) Rules, 1994 notified vide S.O.2882, dated 3.10.1994.

[3] *Substituted by Rule 4; ibid.*

likely to cover major accident hazards, and that activity shall be deemed to have commenced on the date on which the modification was made;

Ministry of Environment & Forest Notification, New Delhi 21st July 2009.

S.O. (E). 1799.- In exercise of powers conferred by Sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby makes the following rules to anend the Hazardous wastes (Management, handling and Transboundary Movement) Rules, 2008,

In sub- rules (5), the following shall be inserted, namely: Provided that the Port or Customs authorities shall, in case of import of Hazardous waste covered under Basel numbers B1040, B1050, B1100, B1230 and B3020 as specified in part B of the Schedule III, ensure that shipment is accompanied by the Movement Document in Form 9 and preshipment inspection certificate issued by the inspection agency certified by the exporting country.

Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules, 2008; Hazardous Wastes (Management, Handling and Trans-boundary Movement) Amendment Rules, 2009: in sub-rule (5), the following shall be inserted, namely; "Provided that the Port or Customs authorities shall, in case of import of hazardous wastes covered under Basel number B1010, B1040, B1050, B1100, B1230 and B3020 as specified in Part B of the Schedule H, I, ensure that shipment is accompanied by the movement document in Form 9 and pre-shipment inspection certificate issued by the inspection agency certified by the exporting country."

In the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 (hereinafter referred to as the said Rules), in Rule 16 in sub-rule (5) in the provision, after the words 'the exporting country', the words "or the inspection and certification agency approved by the Director General of Foreign Trade" shall be inserted.

In schedule III to the said Rules, in Part B, after the entries and before the note, after the words 'without any license or restriction', the words, "or by importer registered with the State Pollution Control Board on behalf of the actual user who shall furnish the details of such import and particulars of the actual users along with quantities to the concerned State Pollution Control Board on a quarterly basis," shall be inserted.
Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules, 2008. These rules shall apply to the handling of hazardous wastes as specified in schedules. These rules have schedule I title, II title, II-part A, Part B, Part C; Schedule IV, V, VI, VII; These Rules have Form 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

After sub-rule (6), the following sub rule shall be inserted, namely, "(6A) Nothing contained in sub-rule (6) shall apply to the hazardous wastes covered under the Basel numbers B1010, B1040, B1050, B1100, B1230 and B3020 as specified in part B of the schedule III; provided that the customs authority may, at any time if it considers necessary, make random inspection of the consignment prior to clearing the consignment." In the said Rules, in Rule 18, in sub-rule (5), for the word and figure 'Form 10', the word and figure 'Form 3' shall be substituted.

In the said Rule, in Schedule III; (i) in Part B, against Basel number B3020, in the entries under column (2), for the words and signs, 'Paper, paperboard and paper products wastes', the following words and signs shall be substituted, namely, 'Paper, paperboard and paper product wastes' (ii) after the entries relating to Part B and before the note, for the signs and words, "Import permitted in the country without any license or restriction," the following signs and words shall be substituted, namely, "Import permitted in the country by the actual users without any license or

restriction," In the said Rules in Form 3 for the words, figures and brackets, 'See rules 5(6) and 22(1)', the words, figures and brackets, 'See rules 5(6), 18(5) and 22(1)' shall be substituted.

The Rules define procedure for handling hazardous wastes: Responsibilities of the occupier for handling of hazardous wastes; grant of authorisation for handling hazardous wastes; power to suspend or cancel an authorisation; storage of hazardous waste; procedure for recycling, reprocessing or reuse of hazardous wastes; procedure for grant of registration; condition for sale or transfer of hazardous waste for recycling; standards for recycling; utilisation of hazardous wastes; import and export of hazardous wastes; import and export (trans-boundary movement) of hazardous wastes; import and export of hazardous wastes; import and export of hazardous wastes for recycling, recovery and reuses; procedure for export of hazardous wastes from India; procedure for import of hazardous waste; treatment, storage and disposal facility for hazardous wastes; packaging, labelling, and transport of hazardous waste; packaging and labelling; transportation of hazardous waste: Manifest system (Movement document to be used within the country only); Chapter VII, Miscellaneous: Records and returns; responsibility of authorities; accident reporting and follow up; liability of occupier, transporter, operator of a facility and importer.

The Rules contain Schedules, namely, **Schedule I:** List of processes of generation of hazardous wastes; **Schedule II:** List of waste constituents with concentration limits; **Schedule III, Part A:** List of hazardous wastes applicable for import with prior informed consent (Annexure VIII of the Basel Convention); Part B: List of Hazardous wastes applicable for import and export not requiring prior informed consent (Annexure IX of the Basel Convention); Part C: List of hazardous characteristics - Explosive; Flammable liquids; Flammable solids; Substances or wastes liable to spontaneous combustion; Substances or wastes which, in contact with water emit flammable gases; Oxidising; Organic Peroxides; Poison (Acute); Infectious substances; Corrosives; Liberation of toxic gases in contact with air or water; Toxic (Delayed or chronic); Eco-toxic; **Schedule IV:** List of hazardous wastes requiring registration for recycling/reprocessing; **Schedule V**, Part A: Specification of used oil suitable for reprocessing/recycling; Part B: Specifications of fuel derived from waste oil; **Schedule VI:** Hazardous wastes prohibited for import and export; **Schedule VII:** List of authorities and corresponding duties.

The Rules contain Forms, namely, **Form 1:** Application for obtaining authorisation for collection/reception/treatment/transport/storage/disposal of hazardous waste; **Form 2:** Form for grant/renewal of authorisation by SPCB/PCC for occupiers, reprocessors, reusers and operators of facilities for collection, reception, treatment, storage, transport, and disposal of hazardous waste; **Form 3:** Format for maintaining records of hazardous wastes by the occupier or operator of a facility; **Form 4:** Form for filing annual returns by the occupier or operator of facility; **Form 5:** Form of application for grant/renewal of registration of industrial units possessing environmentally sound management facilities for reprocessing/recycling; **Form 6:** Form for filing annual returns and records on recyclable hazardous wastes by the recyclers; **Form 7:** Application for import or export of hazardous waste for reprocessing/recycling/reuse; **Form 8:** Application for trans-boundary movement of hazardous waste; **Form 9:** Trans-boundary movement – movement document; **Form 10:** Format for maintaining records of hazardous waste imported and exported; **Form 11:** Transport emergency (Trem) Card; **Form 12:** Marking of hazardous waste container; **Form 13:** Hazardous waste manifest.

Factories Act, 1948: The Act defines 'factory' as any premises including the precincts thereof - (i) whereon ten or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a

manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or (ii) whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines 'hazardous process' as any process or activity in relation to an industry specified in the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would - (i) cause material impairment to the health of the persons engaged in or connected therewith, or result in the pollution of the general environment where on twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the union, a railway running shed or a hotel, restaurant or eating place.

The Act defines 'manufacturing process' as any process for - (i) making, altering, repairing, ornamenting, finishing, packing, oiling, washing, cleaning, breaking up, demolishing, or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal, or (ii) pumping oil, water, sewage or any other substance; or (iii) generating, transforming or transmitting power; or (iv) composing types for printing, printing by letter press, lithography, photogravure or other similar process or book binding; (v) constructing, reconstructing, repairing, refitting, finishing or breaking up ships or vessels; (vi) preserving or storing any article in cold storage.

It defines 'worker' as a person employed, directly or by or through any agency (including a contractor) with or without the knowledge of the principal employer, whether for remuneration or not, in any manufacturing process, or in cleaning any part of the machinery or premises used for a manufacturing process, or in any other kind of work incidental to, or connected with, the manufacturing process, or the subject of the manufacturing process, but does not include any member of the armed forces of the union.

The Water (Prevention and Control of Pollution) Act, 1974, (Amended in 1988): The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for maintaining or restoring the wholesomeness of water in the country. The Act was amended in 1988. It enables the Government through Central and State Pollution Control Boards to prescribe standards and has provisions for monitoring and compliance and penal provisions against the violators of the Act. The Water (Prevention and Control of Pollution) Act, 1974, as amended, deals comprehensively with water issues. It empowers the Government to maintain the wholesomeness of National Water Bodies. The Act also provides for prohibition on use of stream (includes inland water whether natural or artificial) or well for disposal of polluting matter etc.

This Act provides for the prevention and control of water pollution and for maintaining or restoring the wholesomeness of water. Section 2 of the act defines 'pollution' as contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to create a nuisance or render such water harmful or injurious to public health or safety or to domestic, commercial, industrial, agriculture or other legitimate uses, or to the life and health of animals, plants or aquatic organisms.

Chapter 5 of the Act on Prevention and Control of Water Pollution deals with the power of State Government to restrict the application of the Act to certain areas; Power to obtain information; Power to take sample of effluents and procedure to be followed; Seek reports of the result of analysis on samples taken under Section 21; Power of entry and inspection; Prohibition on use of stream or well for disposal of polluting matter etc; Restrictions on new outlets and new discharges; Provision regarding existing discharge of sewage or trade effluent; Refusal or withdrawal of consent by State Board; Appeals; Revision; Power of State Board to carry out certain works; Furnishing of information to State Board and other agencies in certain cases; Emergency measures in case of pollution of stream or well; Power of Board to make application to courts for restraining apprehended pollution of water in streams or wells; and Power to give directions.

The Air (Prevention and Control of Pollution) Act, 1981 (as amended in 1987): This Act provides for the prevention, control and abatement of air pollution. Chapter 1 defines 'Air Pollution' as any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or living creatures or plants or property or environment.

Explosives Act, 1884: The Act regulates the manufacture, possession, use, sale, [transport, import and export] of Explosives. This Act was enacted to prevent accidents at various points of handling of explosives. It does not include any provision for prevention of crime involving explosives. The Act defines 'explosives' as any substance, whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous, used or manufactured with a view to produce a practical effect by explosion or pyrotechnic effect. The term includes gunpowder, nitroglycerine, detonators etc. as also fireworks and fog signals. The following rules have been framed under this Act.

Explosives Rules, 1983: The Rules are framed under Section 5 and 7 of the Explosives Act, 1884 (4 of 1884) and extend to various compositions of explosives. The rules define 'authorised explosives' as explosives included in a list of authorised explosives published by the Central Government from time in the Official Gazette.

The Rules have set safety distance categories of explosives. Explosives are divided into four categories according to the risks they present when initiated, namely: (i) Category X – Those explosives, which have a fire or a slight explosion risk or both, but the effect of which will be local, (ii) Category Y – Those explosives, which have a mass fire risk or a moderate explosion risk, but not the risk of mass explosion, (iii) Category Z – Those explosives, which have a mass explosion risk and major missile effect, (iv) Category ZZ – Those explosives, which have a mass explosion risk and minor missile effect.

The Noise Pollution (Regulation and Control) Rules, 2000: The Rules are framed with the objective of maintaining ambient air quality standards in respect of noise and in view of increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices, which have deleterious effects on human health and the psychological well being of the people. The Rules defines 'area/zone' as all areas which fall in either of the four categories given in the Schedule annexed to these Rules, namely, Industrial area, Commercial area, Residential area and Silence Zone. The Act defines 'person' in relation to any factory or premises as a person or occupier or his agent, who has control over the affairs of the factory or premises.

The Rules define Ambient Air Quality Standards in respect of noise for different areas/zones. It made provision for the State

Government to categorise the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas.

The Rules dated 14th February 2000 has been amended vide Notification S.O. 1046 (E) dated 22nd November, 2000. These rules are called the Noise Pollution (Regulation and Control) (Amendment) Rules, 2000. The Amendment defines authority as any authority or officer authorised by the Central Government, or as the case may be, the State Government in accordance with the laws in force and includes a District Magistrate, Police Commissioner, or any other officer not below the rank of the Deputy Superintendent of Police, designated for the maintenance of ambient air quality standards in respect of noise under any law for the time being in force. The Amendment also defines 'Silence zone' an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area, which is declared as such by a competent authority.

The Noise Pollution (Regulation and Control) Rules, 2000 include 'fire crackers, sound producing instruments', besides 'construction activity'. In sub-clause (ii), for the words, 'public address system, appliances or apparatus', the words 'public address system, horn, appliances or apparatus' has been substituted.

Noise Pollution (Regulation and Control) (Amendment) Rules, 2002 vide S.O 1088 (E) dated the 11th October 2002. The Amendment directs the State Government to reduce noise pollution, permit use of loud speakers or public address systems during night hours (between 10.00 p.m. to 12.00 midnight) on or during any cultural or religious festive occasion of a limited duration, not exceeding fifteen days in all during a calendar year.

Amendment vide S.O. 1569 (E) dated the 19th September, 2006 provides for the State Pollution Control Board (in consultation with Central Pollution Control Board) for collection, compilation, and publication of technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.

The Noise Pollution (Regulation and Control) (Amendment) Rules, 2010: The Noise Pollution (Regulation and Control) (Amendment) Rules, 2010, vide Notification dated 11th January, 2010. The Amendment in Rules 5 provides for restrictions on the use of horns, sound emitting construction equipments and bursting of fire crackers. Further, sound emitting construction equipments shall not be used or operated during night time (defined as period between 10:00 PM-6:00 AM) in residential areas and silence zones.

Gas Cylinders Rules, 1981: The Rules regulate the possession, delivery, despatch, handling, examination, and testing of gas cylinders.

Static and Mobile Pressure Vessels (Unfired) Rules, 1981: The Rules regulate the construction, fitment, storage, loading, transport, licensing and inspection of pressure vessels intended for storage and transport of any compressed gas, including Liquefied Petroleum Gas. The administration of the Act requires interaction with the Ministries of Coal, Mines, Petroleum, Environment and Home Affairs. The manufacturing industry for explosives is licensable under the Industries (Development and Regulation) Act, 1951.

Notifications under the Explosives Act, 1884: The Notification No. M-1217, dated 20th November, 1926 was issued in exercise of the powers conferred by Section 17 of the Indian Explosives Act, 1884 (IV of 1884), and in supersession of the Commerce and Industry Department Notification No. 12455, dated the 20th October, 1917, wherein the Governor-General-in-Council declared that picric acid, picrates and mixtures of picric acid shall be deemed to be explosives within the meaning of the said Act with exceptions.

Industries Development and Regulation Act, 1951 (Act No. 65 of 1951): It's an Act to provide for the development and regulation of certain industries**.** The Act has provision for imposition of cess on scheduled industries in certain cases - (1) These may be levied and collected as a cess for the purposes of this Act on all goods manufactured or produced in any such scheduled industry as may be specified on this behalf by the Central Government by Notified Order a duty of excise at such rate as may be specified in the Notified Order, and different rates may be specified for different goods or different classes of goods.

Environment Impact Assessment (EIA) Notification, September 14, 2006: Undertaking mine level EIA and formulating Environment Management Plan (EMP) is mandatory for seeking Environmental Clearance (EC) under EIA Notification, 2006. Mining projects that have a lease area of more than 50 hectares in size are classified under Category A and need EC from National level Environmental Impact Assessment Authority created with MoEF in Government of India. Mining projects that have a lease area between five to 50 hectares are classified as Category B projects and require EC from SEIAA created with respective State Department of Environment in the State Government. Mine leases smaller than five hectares in size are not covered under the EC process initiated by EIA Notification, 2006.

The projects/activities listed for prior environment clearance included in the said Notification under: 1. Mining are extraction of natural resources and power generation (for a specified production capacity), Mining of minerals, Offshore and onshore oil and gas exploration, development and production, River Valley projects, Thermal Power Plants, Nuclear power projects and processing of nuclear fuel. 2. Primary Processing are Coal washeries, Mineral beneficiation. 3. Materials Production are Metallurgical industries (ferrous and non ferrous), Cement plants. 4. Material processing are Petroleum refining industry, Coke oven plants, Asbestos milling and asbestos based products, Chlor-alkali industry, Soda ash Industry, Leather/skin/hide processing industry. 5. Manufacturing/ Fabrication are Chemical fertilisers, Pesticides industry and pesticide specific intermediates (excluding formulations), Petro-chemical complexes (industries based on processing of petroleum fractions and natural gas and/or reforming to aromatics), Manmade fibres manufacturing, Petrochemical based processing (processes other than cracking and reformation and not covered under the complexes), Synthetic organic chemicals industry (dyes and dye intermediates, bulk drugs and intermediates excluding drug formulations, synthetic rubbers, basic organic chemicals, other synthetic organic chemicals and chemical intermediates), Distilleries, Integrated paint industry, Pulp and paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching, Pulp and paper industry excluding manufacturing of paper from waste paper and manufacture of paper from ready pulp without bleaching, Sugar Industry, Induction/arc furnaces/cupola furnaces 5TPH or more. 6. Service Sectors are Oil and gas transportation pipe line (crude and refinery/petrochemical products), passing through national parks/ sanctuaries/ecologically sensitive areas including LNG Terminal, Isolated storage and handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 and 3 of MSIHC Rules 1989, amended in 2000). 7. Physical Infrastructure including Environmental Services are Air ports, Industrial estates/parks /complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes, Common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) and Common Effluent Treatment Plants (CETPs).

The said notification has set Specific Condition (SC) for appraisal of Industrial projects for Environment Clearance, which are: "If any Industrial Estate/Complex/Export processing Zones/Special Economic Zones/Biotech Parks/Leather Complex with homogeneous

type of industries, such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre-defined set of activities (not necessarily homogeneous) obtain prior environmental clearance, individual industries including proposed industrial housing within such estates/complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate)."

Environment Impact Assessment Notification Dated 14th September, 2006 and Subsequent Amendments– Clarification Regarding EIA Clearance for Change in Product-Mix: The Ministry of Environment & Forest had issued Interim Operational Guidelines on 13th October, 2006. Further to these Guidelines, the following clarification was issued for Environment Clearance for the category of products involving change in Product-Mix. It clarifies that (1) in cases of change in Product-Mix, changes in the quantities or numbers of products may be allowed without prior Environmental Clearance by the concerned State Pollution Control Board, provided such changes in the quantities of products are in the same category and are within the previously granted overall total limits; and (2) projects involving modernisation of the existing unit with increase in the total production capacity beyond the threshold limit specified in the Schedule to the Notification through change in the process or technology or change in the product mix or debottle-necking or a combination of these, involving increase in pollution load, will obtain prior Environment Clearance from the concerned Regulatory Authority under the EIA Notification, 2006. MoEF Circular vide File No J 13011/81/2006-IA II (I), dated 6th February, 2007, clarified regarding consideration of integrated projects for Environment Clearance by Expert Appraisal Committee. It states that Industry projects with mining component will be considered by the 'Industry Committee' and stand alone mining projects will be considered by 'Mining Committee'.

Memorandum of Ministry of Environment and Forests, Government of India vide J. 11013/41/2006-IA.II (I) dated April 06, 2011: The said Memorandum stipulates 'Additional Conditions' in respect of Mega Projects already granted Environmental Clearance In accordance with the recommendations contained in the Report of the Monitoring Committee constituted to examine the issues relating to monitoring of projects (hosted on MoEF website) and their acceptance by the Competent Authority, it has been decided that henceforth all mega projects namely: (i) Coal based thermal power plant with a capacity of 500 MW and above; (ii) Cement plant with a capacity of three million TPA and above, which have already been accorded environmental clearance, besides effectively complying with the conditions stipulated in the environment clearance letter issued to the respective projects, shall also comply with the following additional conditions:

1. Continuous monitoring of stack emissions as well as ambient air quality (as per notified standards) shall be carried out and continuous records maintained. Based on the monitored data, necessary corrective measures, as may be required from time to time, shall be taken to ensure that the levels are within permissible limits. The results of monitoring shall also be submitted to the respective Regional Office of MoEF regularly. Besides, the results of monitoring will also be put on the website of the company in the public domain.
2. The six monthly monitoring report as well as the monitored data on various parameters as stipulated in the environment clearance conditions shall be put on the website of the company and also regularly updated. The monitored data

shall also be submitted to respective State Pollution Control Board / Union Territory Pollution Control Committees and the Regional Office of MoEF.

3. The ambient air quality data as well as the stack emission data will also be displayed in public domain at some prominent place near the main gate of the company and updated in real time.

The Forest (Conservation) Act, 1980: The Forest (Conservation) Act, 1980, as amended in 1988, checks the indiscriminate diversion of forest land for non-forest purposes. It primarily deals with discouraging the diversion of forest lands for non-forestry purpose, mainly industry and mining. It requires State Governments to acquire the approval of the Central Government before it denotifies any forest, leases forest land to a private person or corporation, or clears it, even for the purpose of reforestation.

Prior clearance of projects requiring diversion of forests for non-forest purpose is needed under the Forest (Conservation) Act, 1980. The State Government/Union Territories are required to submit formal proposals to the Central Government (Ministry of Environment and Forests) for diversion of forest land for non-forest purposes in the prescribed proforma, along with details, such as flora, fauna, map of the area, compensatory afforestation proposed etc. Therefore, as far as possible, non-forest land should be selected for projects.

As per the amended Forest (Conservation) Rules in force now, the Regional Chief Conservator of Forests has the powers to decide proposals involving forest land up to five hectares. Proposals involving forest land between 5-20 hectares shall be processed by the Regional Chief Conservator in consultation with a State Advisory Group consisting of representatives of the concerned State Government. Proposals involving more than 20 hectares of forest land are required to be placed before the Advisory Committee constituted by the MoEF, Government of India.

Some important guidelines laid down in Forest (Conservation) Act, 1980 and Rules, for diversion of forest land for non-forest purposes as may be relevant for Himachal Pradesh are given below:

- These guidelines ensure that ecological considerations are in no way undermined while examining investment proposals. The State Government or the Union Territory administration concerned is required to envisage at the initial stage itself, the different likely impacts of the proposed project, starting with the proposed site. The guidelines specify certain criteria for the siting of an industry. It states that no projects should be in the vicinity of National Parks, Wildlife Sanctuaries and Core areas of the Biosphere Reserves. Further, the project needs to consider scenic landscapes, areas of geo-morphological significance, unique and representative biomes and ecosystems, heritage sites/structures and areas of cultural heritage and importance. It also includes fragile ecosystems, such as mountains, areas rich in coral formations as well as deserts, wetlands, and riverine ecosystems, Areas rich in biological diversity, gene pool and other natural resources.
- Investors in industrial projects involving forest land are required to undertake detailed Environmental Impact Assessment Studies of their projects with respect to physical resources, hydrology, and water quality, socio-economic aspects, human use values etc.
- Besides forest lands, diversion of prime agricultural lands for non-forest purposes are also restricted.
- Investigations and surveys carried out in connection with hydro-electric projects, transmission lines, seismic surveys, exploration for oil drilling or mining will not attract the provisions of the Forest Act provided these surveys are restricted to only

clearing of bushes and lopping of tree branches and do not involve clearing of forests or cutting of trees.

- Such surveys, investigations and explorations are prohibited in Sanctuaries, National Parks, Biosphere Reserves and in the preservation and sample plots under the Wildlife (Protection) Act, 1972.
- The permission to survey, explore or prospect does not imply any commitment on the part of the Central Government for any subsequent use of the forest land.

Energy Conservation Act, 2001: According to this Act, usage of energy should be kept at minimum both at the point of generation as well as at the point of application. These include short term as well as long term measures. The short term measures include: energy conservation, energy audit of Government buildings and capacity building amongst Departments to take up energy efficiency programmes. The long term measures include; industry specific task forces, notifying more industries as designated consumers, conduct of energy audit amongst notified designated consumers, recording and publication of best practices (sector-wise), development of energy consumption norms and monitoring of compliance with mandated provision by designated consumers.

Wildlife Protection Act, 1972: The Government of India enacted the Wildlife (Protection) Act, 1972 with the objective of effectively protecting the wildlife and to control poaching, smuggling and illegal trade in wildlife and its derivatives. It extends to the whole of India, except the State of Jammu and Kashmir, which has its own Wildlife Act. The Act was amended in January 2003 and punishment and penalty for offences under the Act have been made more stringent. The Ministry of Environment and Forests has proposed further amendments in the law by introducing more rigid measures to strengthen the Act. The objective is to provide protection to the listed endangered flora and fauna and ecologically important protected areas.

The Public Liability Insurance Act, 1991: After the Bhopal Gas Leak Tragedy, Parliament enacted the Act called 'The Public Liability Insurance Act, 1991'. Section 2 defines 'accident' to mean an accident involving a fortuitous, or sudden or unintended occurrence while handling any hazardous substance resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property, but does not include an accident by reason only of war or radioactivity. The Act provides for the owner to take out insurance policies, the procedure for making application for relief and the award of relief. Section 13 empowers the Central Government or any person authorised by that Government on this behalf, when it has reason to believe that any owner has been handling any hazardous substance in contravention of any of the provisions of the Act that Government or, as the case may be, that person may make an application to a court, not inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of first class for restraining such owner from such handling. The other provisions of the Act are regarding penalties, offences by Companies, offences by the Act in 1992, which, inter alias, provides for the establishment of Environmental Relief Fund. Section 7-A provides that the Central Government may, by notification, establish a fund to be known as the Environmental Relief Fund.

National Environment Tribunal Act, 1995: This Act provides for liability for damages arising out of any accident occurring while handling an hazardous substance and for the establishment of a National Environment Tribunal for effective and expeditious disposal of cases arising from such accident, with a view to giving relief and compensation for damages to persons, property and the environment and for matters connected with or incidental thereto. The term 'accident' has been defined to mean accident involving a fortuitous or sudden or unintended occurrence while handling any hazardous substance resulting in continuous or intermittent or repeated

exposure to death of, or injury to, any person or damage to any property or environment, but does not include an accident by reason only of war or radio-activity.

The Central Government enacted the Mineral Conservation and Development Rules, 1888 under Section 18 of the Mines and Minerals (Regulation and Development) Act, 1957. Rule 4 provides that every holder of prospecting license shall submit to the Controller General and the Regional Controller, or the authorised officer within a period of 60 years from the date of execution of the prospecting license, a scheme of prospecting indicating the manner in which he proposes to carry out the prospecting operations in the area covered by the license. Rule 9 requires submission of mining plan and the mining operation is to be carried out in accordance with this plan.

Chapter-V of the Rules deals with environment, providing for taking all possible precautions for the protection of environment and control of pollution while conducting prospecting, mining, beneficiation or metallurgical operations in the area. The Rules also provide for removal and utilisation of top soil, storage of overburden, waste, rock etc.; reclamation and rehabilitation of lands; taking precautions against air pollution; taking precautions with regard to discharge of toxic liquid; taking precaution against noise; and restoration of flora.

National Environmental Appellate Authority Act, 1997: National Environmental Appellate Authority Act, 1997 provides appellate forum for cases relating to site restrictions, developmental schemes and projects so as to balance development and environment. It applies in cases where death or injury to any person or damage to any property is caused by an accident during the handling of any hazardous substance. The *National Environmental Appellate Authority Act of 1997:* this statute established a national environmental appellate authority for hearing appeals against orders granting environmental clearance in areas where restrictions are imposed on setting up any industry carrying on any operation or process.

Land Acquisition Act, 1894: Land requirements for mining activities and all their associated facilities can be significant. Land acquisition is being done under the Land Acquisition Act 1894, amended in 1984. Historically, land for large mines has been acquired by the State. The Land Acquisition Act, 1894is currently being modified to link it with the resettlement and rehabilitation (R&R) Policy. The draft version of the Act seeks to make resettlement and rehabilitation enforceable, and includes livelihoods, habitats, cultural and natural resources as critical areas of impact to be compensated and addressed, and, modification of the clause of 'public purpose' for acquisition. It also provides for valuing land at replacement value and not market value as is the status today.

The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006: It establishes a process by which forest dwelling and other forest dependent communities can claim and get their rights settled on designated forest land. A number of projects, including mining projects, are being asked to investigate forest rights, even in cases of some, who have already received forest and environmental clearance.

The Indian Boilers Act, 1923, 5 of 1923 (23rd February, 1923): It's an Act to consolidate and amend the law relating to steam boilers.

Indian Boiler (Second Amendment) Regulation, 2006: This regulation is made under Section 28 of the Indian Boilers Act, 1923. In the Indian Boiler Regulations (1950), in regulation 4, in clause © after sub clause (iv), the following sub clause shall be inserted, namely, (vii) For such boilers, having a capacity of 20 tonnes per hour and above, which are required to be assembled at site, the mountings may be supplied separately. All boilers of capacity less than 20 tonnes per hour shall carry all the mounting or fitting certificates in

respective forms with details mentioned in Form III issued at the time of manufacture of boilers.

Geographical Indications of Goods (Registration and Protection) Act, 1999 (No. 48 of 99): It's an Act to provide for the registration and better protection of geographical indication relating to goods. The Act defines 'Geographical Indication' in relation to goods; it means an indication, which identifies such goods as agricultural goods, natural goods or manufactured goods as originating from or manufactured in the territory of a country or a region or locality in that territory, where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical origin and in case where such goods are manufactured goods one of the activities of either the production or of processing or preparation of the goods concerned has taken place in such territory, region or locality, as the case may be.

The Geographical Indications of Goods (Registration and Protection) Rules, 2002: The Rules define application for registration of a geographical indication that includes the geographical indication for goods contained in it. The Rules define procedure for geographical indication, which serves to designate the goods as originating from the concerned territory of the country or region or locality in the country, as the case may be, in respect of specific quality, reputation or other characteristics, which are due exclusively or essentially to the geographical environment, with its inherent natural and human factors, and the production, processing or preparation of which takes place in such territory, region or locality as the case may be.

The Workmen's Compensation Act, 1923: It's an Act to provide for the payment by certain classes of employers to their workmen as compensation for injury by accident.

The Industrial Disputes Act, 1947 (Act No. 14 of 1947): It's an Act to make provision for the investigation and settlement of industrial disputes and for certain other purposes.

The Act defines 'industry' as any systematic activity carried on by co-operation between an employer and his workmen (whether such workmen are employed by such employer directly or by or through any agency, including a contractor) for the production, supply or distribution of goods or services with a view to satisfy human wants or wishes (not being wants or wishes, which are merely spiritual or religious in nature), whether or not, (i) any capital has been invested for the purpose of carrying on such activity; or (ii) such activity is carried on with a motive to make any gain or profit, and includes (a) any activity of the Dock Labour Board established under Section 5A of the Dock Workers (Regulation of Employment) Act, 1948 (9 of 1948); (b) any activity relating to the promotion of sales or business or both carried on by an establishment. The Act defines industrial dispute as any dispute or difference between employers and employers or between employers and workmen, or between workmen and workmen, which is connected with the employment or non-employment or the terms of employment or with the conditions of labour, of any person

The Contract Labour (Regulation and Abolition) Act, 1970 (Act No. 37 of 1970): An Act to regulate the employment of contract labour in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith. It applies to every establishment in which twenty or more workmen are employed or were employed on any day of the preceding twelve months as contract labour and to every contractor, who employees or who employed on any day of the preceding twelve months twenty or more workmen. The Act defined workman as deemed to be employed as 'contract labour' in or in connection with the work of an establishment when he is hired in or in connection with such work by or through a contractor, with or without the knowledge of the principal employer. Further, 'contractor' is

defined - in relation to an establishment - as a person, who undertakes to produce a given result for the establishment, other than a mere supply of goods of articles of manufacture to such establishment, through contract labour or, who supplies contract labour for any work of the establishment and includes a sub-contractor.

The Salt Cess Act, 1953: An Act to provide for the levy and collection of a Cess on salt for the purpose of raising funds to meet the expenses incurred on the salt organisation maintained by the Government and on the measures taken by Government in connection with the manufacture, supply and distribution of salt, unless the context otherwise requires.

The Act defines 'manufacture' in relation to salt includes collection, removal, preparation, steeping, evaporation, boiling or any one or more of these processes, the separation or purification of salt obtained in the manufacture of saltpetre, the separation of salt from earth or other substances, so as to produce alimentary salt, and the excavation or removal of natural saline deposits or efflorescence; and the work 'manufacturer' shall be construed accordingly and shall include not only a person, who employs hired labour in the production or manufacture of salt, but also any person, who engages in its production or manufacture on his own account if the salt is intended for sale.

The Export (Quality Control and Inspection) Act, 1963, (No. 22 of 1963) as Amended by Export (Quality Control and Inspection) Amendment Act, 1984 (No. 40 of 1984): It's an Act to provide for the sound development of the export trade of India through quality control and inspection and for matters connected therewith. The Act defines 'Inspection', in relation to a commodity, means the process of determining whether a batch of goods in that commodity complies with the standard specifications applicable to it or any other specifications stipulated in the export contract generally by inspecting either the whole batch or a selected sample or samples, which purport to represent the whole batch. The Act also defines 'quality control', as any activity having for its object the determination of the quality of a commodity whether during the process of manufacture or production or subsequently) in order to ascertain whether it satisfies the standard specifications applicable to it or any other specifications stipulated in the export contract and whether it may be accepted for purposes of export.

Special Economic Zones (SEZ) Act, 2005 (No. 28 of 2005): SEZ is an Act to provide for the establishment, development and management of Special Economic Zones for the promotion of exports and for matters connected therewith or incidental thereto.

A Special Economic Zone may be established under this Act, either jointly or severally by the Central Government, State Government, or any person for manufacture of goods or rendering services or for both or as a Free Trade and Warehousing Zone.

The areas falling within the Special Economic Zones may be demarcated by the Central Government or any authority specified by it as- (*a*) the processing area for setting up units for activities, being the manufacture of goods, or rendering services; or (*b*) the area exclusively for trading or warehousing purposes; or (*c*) the non-processing areas for activities other than those specified under clause (*a*) or clause (*b*).

The Foreign Trade (Development and Regulation) Act, 1992 Act No. 22 of 1992 [7th August, 1992]: It's an Act to provide for the development and regulation of foreign trade by facilitating imports into, and augmenting exports from India and for matters connected therewith or incidental thereto.

The Water (Prevention and Control of Pollution) Cess Act, 1977 (Amended in 1992 and 2003): It's an Act to provide for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water

pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974.

Cement Cess Rules, 1993: Cement Cess Rules, 1993, Ministry of Industry (Department of Industrial Development), No. S.O 126 (E), has been set up as required by Sub-section (1) of Section 30 of the Industries (Development and Regulation) Act, 1951 (65 of 1951). These Rules define the 'Cess' as Cess levied and collected in terms of Order No. S.O 125 (E) dated 24th February, 1993 of Department of Industrial Development, issued under Sub-section (1) Section 9 of the Act. Further, it defines 'cement' as any variety of cement manufactured in India, and includes Portland Pozzolana cement, blast furnace slag cement, water-proof (hydrophobic) cement, rapid hardening cement, low heat cement, masonry cement, high strength ordinary Portland cement, oil-well cement and white cement. It also defines 'manufacturer' as any cement plant producing cement, excluding cement plants of capacity less than 99000 tonnes per annum based on rotary kiln and 66000 tonnes per annum based on vertical shaft kilns.

State Level Policies/ Regulations

Industrial Policy, 2004: The Industrial Policy serves as a guideline for: Achieving the objective of uniform growth of industry and service sector throughout the State; diverse industries and service sector activities; cull together ingredients of a Industrial Policy so as to facilitate the generation of employment opportunities for local resource owners and stakeholders; clearly state Government's commitment and approach to the development of key infrastructural sectors, like Power, Housing, Social Infrastructure Development, Human Resource Development and Vocational Education so as to create a congenial investment climate for existing industry to grow as well as to attract further investments in the State; clearly spell out Industrial Incentives of fiscal nature, specifically address the issues impeding industrial growth, such as procedures for setting up of industry; obtaining permissions required under various Labour Laws; addressing issues related to transportation of industrial produce so as to lay the foundation of strong and consistent growth of the industrial sector. It is expected that 'State of Art Technology' is used to ensure least environmental degradation. In addition to other conditions, while granting the lease, the environmental clearance and clearance under Forest Conservation Act, 1980 etc. are required as provided in the Rules. As per present Policy of the State, at least 50 percent of clinker or any other percentage as prescribed by the Government, has to be converted into cement through grinding units located in the State. The cement plant will be eligible for incentives as per the Industrial Policy of the State and Central Government prevalent at the time of coming into production. Further, the applicant shall be required to meet the conditions of the employment of at least 70 percent of *Himachalis* as prescribed in the Industrial Policy Guidelines, 2004 and as amended from time to time.

Forest Sector Policy, 2005: The Forest Sector Policy seeks to achieve sustainable forest management in Himachal Pradesh, i.e., forests, watersheds, wildlife, biodiversity and habitats for the maintenance and rehabilitation of its environment and strive for enhanced livelihoods for the people of the State, especially women and other resource poor groups.

Within the framework of the National Forest Policy, 1988, the basic objectives of the Forest Sector Policy of Himachal Pradesh are to conserve and improve the status of natural resources in the State, especially forests, wildlife and biodiversity through effective watershed management practices and strive towards an appropriate land use in the State, especially in the context of Sustainable Forest Management, focusing on other primary land use sectors, such as agriculture, horticulture,

animal husbandry and those related to infrastructure development.

The Forest Sector Policy, 2005 has outlined following broad strategies:

- The Himachal Pradesh Forest Department (HPFD), in consultation with other stakeholders, will devise criteria and mechanisms to assess and categorise the State's forests into conservation, production, community and urban forests. Necessary modifications in the working plan code will be made to accordingly reorganise these forests in a time bound manner and make provisions for periodically reviewing such categories.

Section 6.10 of the said Policy describes 'Forest Based Industries'. It mandates that the Government will develop incentives to encourage wood based enterprise to procure raw material from sources other than Government forests. The wood based industries in rural areas will be regulated through *Gram Sabhas*. Special attention will be given to value addition and diversification of wood and forest based products.

State Water Policy: The Policy mentions, "Water resources development and management will have to be planned for a hydrological unit, such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects as well as environmental considerations. All individual developmental projects and proposals should be formulated and considered within the framework of such an overall plan keeping in view the existing agreements/awards for a basin or a sub-basin so that the best possible combination of options can be selected and sustained."

The Policy recommends watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest cover and the construction of check-dams and trenching. Efforts shall be made to conserve the precipitation in the catchment area itself.

It mandates that overriding ownership rights over water resources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a State's perspective, after taking into account the requirement of areas/basins. Water scarce neighbourhoods will enjoy priority entitlement to avail the water available in adjoining areas for meeting their drinking water needs.

Water quality is impacted by untreated or inadequately treated industrial effluents and sewage flowing into *nallahs* and rivers or affecting the surface and groundwater. Since this can adversely affect the health of the populace, special attention will have to be paid to these aspects. Improvements in existing strategies, innovation of new techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and groundwater resources to restore the pristine quality of former years. Technology and training have to play important roles in the development of water resources and their management.

Water Allocation Priorities: In the planning and operation of systems, water allocation priorities should be broadly drinking water followed by irrigation, ecology, afforestation / biodiversity / tourism, agro-industries, hydro-power, non-agro-based industries, and navigation and other uses.

The Himachal Pradesh Groundwater (Regulation and Control of Development and Management) Rules, 2006: The Authority, with a view to implementing the provisions of the Act, may (a) Issue guidelines for adoption of Rain Water Harvesting for groundwater recharge; (b) suggest suitable measures to be followed, both in rural and urban areas, by the inhabitants at hill tops, spurs and on river/stream banks; (c) prepare schemes for groundwater management in rural

and urban areas; (d) undertake Information, Education and Communication activities including workshops, seminars, public discourses, debates, radio and television programmes to promote Rain Water Harvesting; and (e) encourage construction of community rain water storage or percolation tanks, ponds, check dams or recharge shafts in catchment areas.

The Authority, may issue directions to the local authorities and the Government Departments to include in their developmental schemes/plans, the provision of Rain Water Harvesting for groundwater recharge in the notified areas provided that in urban areas within the notified area no directions issued under these rules shall be applicable for construction of rain water harvesting structures: (a) in residential or commercial premises having plinth area of less than 100 square metres; or (b) in the sinking zones, where construction of rain water harvesting structures would be detrimental to the safety of the building structures in the area .

The Himachal Pradesh *Panchayati Raj* Act, 1994: This is an Act to consolidate, amend and replace the law relating to *Panchayats* with a view to ensure effective involvement of the *Panchayati Raj* Institutions in the local administration and developmental activities.

Chapter III of this Act states about framing and finalising of schemes for execution. The housing and development schemes may be of one of the following types or combination of any two or more of such types of schemes or of any special features thereof, namely: (a) a land development scheme; (b) a city or town or village development scheme; (c) a housing scheme; (d) an industrial area development scheme; (e) a commercial/tourism scheme; and (f) an infrastructural development scheme.

The *Gram Sabha* shall perform the functions, which include (a) mobilising voluntary labour and contribution in kind and cash for the Community Welfare Programmes; (b) identification of beneficiaries for the implementation of developmental schemes pertaining to the village; and (c) rendering assistance in the implementation of developmental schemes pertaining to the village. In addition, it

- Approves plans, programmes and budget, prepared by the *Gram Panchayat* for economic development and social justice.
- Authorises, after being satisfied, issuance of utilisation certificate of funds spent on the implementation of the plans, projects and programmes of the *Gram Panchayat*.

A *Gram Panchayat* shall have control over all public streets, waterways, other than canals as defined in any other enactment for the time being in force relating to a canal or a minor canal, situated within its jurisdiction, not being a private street or waterway and not being under the control of the Government or any other authority specified by the Government and may do all things necessary for their maintenance and repair, such as (a) deepen or otherwise improve water ways; (b) notify the setting apart of any public water course for drinking or culinary purposes, and prohibit bathing, washing of clothes and animals or doing of other acts likely to pollute the course so set apart.

Chapter IV-A of this Act provides special provision relating to the *Gram Panchayats*, *Panchayat Samiti* and *Zila Parishad* located in the scheduled areas. Every *Gram Sabha* shall be (i) approve plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the *Gram Panchayat* at the village level; and (ii) be responsible for the identification or selection of persons as beneficiaries under poverty alleviation and other programmes.

Chapter-XII of this Act mentions about the preparation of development plans and the District Planning Committee. Preparation of development plans includes the following steps: (1) Every *Panchayat* shall prepare every year a development plan to perform functions

specified in Schedule-I and Schedule-II and such other functions as may be specified by the State Government, in so far as the *Panchayat* funds allow to perform such functions within its respective area; and (2) Every *Panchayat* shall prepare every year a development plan of schemes for economic development and social justice for its respective area and submit it to the District Planning Committee constituted under this Act.

The Government shall constitute in every district a District Planning Committee to consolidate the plans prepared by the *Zila Parishad, Panchayat Samitis, Gram Panchayats*, and Municipalities in the district and to prepare a draft development plan for the district as a whole.

The Himachal Pradesh Shops and Commercial Establishments Act, 1969 and Amended Act, 2004 (Act No. 15 of 2004): The Act shall apply in the first instance to the limits of the Shimla Municipal Corporation and to the Municipal areas and cantonment limits; but the Government may, by notification in the Official Gazette, direct that it shall come into force in any other local area or shall apply to such establishments or of class of establishments in such other areas as may be specified in the Notification. The Act defines 'commercial establishment' as any premises wherein any business, trade or profession is carried on for profit, and includes journalistic or printing establishment and premises in which business of banking, insurance, stocks and shares, brokerage or produce exchange is carried on or which is used as hotel, restaurant, boarding or eating house, theatre, cinema or other place of public entertainment or any other place, which the Government may declare, by notification, to be a commercial establishment for the purpose of this Act.

Himachal Pradesh Bricks (Control) Act, 1969 (Act No. 29 of 1969): It's an Act to regulate the manufacture, storage, distribution, transport, acquisition and disposal of bricks in the Union territory of Himachal Pradesh and for matters connected therewith. The Act defines 'Brick' as any piece of burnt clay fired in kiln and having a geometrical shape. The Act gives powers to control manufacture, storage, distribution etc. of bricks, if the Government is of opinion that it is necessary or expedient to do so for maintaining or increasing the supply of bricks for securing their equitable distribution and availability at fair prices, it may, by order, notify in the Official Gazette, (a) for regulating by licenses, permits or otherwise the manufacture, storage, distribution, transport, acquisition or disposal of bricks; (b) for collecting any information or statistics with a view to regulating the aforesaid matters; (c) for the grant of issue of licenses, permits or other documents and the charging of fees therefore; (d) for controlling the prices at which bricks may be bought or sold; (e) for requiring dealer or kiln owners to maintain and produce for inspection such accounts and records regarding bricks and to furnish such information relating thereto, as may be specified in the order; (f) for any incidental and supplementary matters including entering and search of premises and vehicles and the seizure by a person authorised relating to make such search of the bricks in respect of which such person has reason to believe that contravention of any order made under this Act has been, is being or is about to be committed.

The Himachal Pradesh Industrial Establishments (National and Festival Holidays and Casual and Sick Leave) Act, 1969 (Act No. 7 of 1970): It's an Act to provide for the grant of national and festival holidays and casual and sick leaves to persons employed in Industrial Establishments in Himachal Pradesh. The Act defines Industrial establishment as any factory as defined in clause (m) of Section 2 of the Factories Act, 1948, (63 of 1948), or any place, which is deemed to be a factory under Sub-section (2) of Section 85 of that Act; or (ii) any plantation as defined in clause (f) of Section 2 of the Plantations Labour Act, 1951, (69 of 1951).

The Himachal Pradesh Fire Fighting Services Act, 1984 (Act No. 30 of 1984): It's an Act to provide for the maintenance of effective fire fighting service in the State of Himachal Pradesh.

The Himachal Pradesh Factories (Control of Dismantling) Act, 1973 (Act No. 6 of 1974): It's an Act to control the dismantling of Factories in Himachal Pradesh. The Act defines (a) to 'dismantle' a factory means to remove from its position the machinery or part of the machinery of the factory, whereby such removal the factory is rendered wholly or partly useless for its purposes; but does not include any temporary removal within the premises of the factory of the machinery or part of the machinery for purposes, such as adjustment, cleaning and repairs; (b) 'factory' means a factory as defined in clause (m) of Section 2 of the Factories Act, 1948, (63 of 1948), and includes a small scale industry unit with a capital investment of not more than seven *lakhs* and fifty thousand rupees (Rs. 7,50,000), irrespective of the number of persons employed.

The Himachal Pradesh Electricity (Duty) Act, 1975 (Act No. 11 of 1975): This Act seeks to levy duty on the sale or consumption of electric energy in Himachal Pradesh. It defines (b) 'consumer' as any person or establishment that uses or consumes energy and includes industrial consumer, i.e., any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage below 11 KV; any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage from 11 KV to 33 KV; and any person or institution using energy for industrial purpose or purposes subservient to industry having supply voltage above 33 KV.

The Act sets levy of electricity duty on consumption of energy. These shall be levied and paid to the State Government on the energy consumed a duty to be called the 'Electricity Duty' in the prescribed manner and computed at the following rates in case of industrial consumers having supply voltage below 11 KV, at the rate of 33 paise per unit; in case of industrial consumers having voltage from 11 KV to 33 KV, at the rate of 35 paise per unit; and in case of industrial consumers having supply voltage above 33 KV, at the rate of 45 paise per unit.

The Himachal Pradesh Essential Services (Maintenance) Act, 1973: It's an Act to make provisions for the maintenance of certain essential services. The Act defines 'Employment' as employment of any nature and whether paid or unpaid. This Act shall apply to (i) any employment or class of employment under the State Government, which the State Government may, by notification in the Official Gazette, specify; and (ii) any other employment or class of employment, which the State Government, being of opinion that such employment or class of employment is essential for securing the public safety, the maintenance of public order, health or sanitation, or for maintaining supplies or services necessary for the life of the community, may, by notification in the Official Gazette, declare to be an employment or class of employment to which this Act applies.

The Act regulates wages and conditions of service. The State Government may make rules regulating or empowering a specified authority to regulate wages or other conditions of service of persons or of any class of persons engaged in any employment declared under Section 3 to be an employment or class of employment to which this Act applies.

Himachal Pradesh Infrastructure Development Act, 2001: The Act shall apply to such Infrastructure Projects as are implemented by a Government agency through Private Sector partnership under the provision of this Act and fall in the category of infrastructure projects specified in Schedule-I and such other infrastructure projects as are notified by the State Government, by notification, from time to time.

The Himachal Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971): It's an Act to encourage the development of industries in Himachal Pradesh by the grant of State aid. The Act defines 'industry' as any industrial business or enterprise conducted or undertaken either by an individual or by a company, association or body of individuals, whether incorporated or not; 'cottage industry' as any industry that is carried on in a place, which is not a factory for the purposes of the Factories Act, 1948; 'village industries' as any industry, which forms the normal occupation, whether whole-time or part-time, of any class of the rural population of the State; 'machinery' includes plants, apparatus, tools and other appliances required for the purpose of carrying on any industrial operation or process. The Act provides for carrying out the purposes of this Act, the State Government shall, as soon as possible, after the commencement of this Act, establish Board to be called the 'Board of Industries'. The said Board was constituted vide Notification No. 7-2/73-SI (Loan), dated the 31st August, 1973.

The Act describes general provisions regarding the giving of State Aid. It delineates the forms of State aid; industries to which several forms of State aid may be given; and application for State Aid. The Act has provisions for regulating the giving of State Aid other than the supply of machinery on hire-purchase system, and supply of machinery on hire-purchase system.

Notifications and Rules under the Himachal Pradesh State Aid to Industries Act, 1968 The Himachal Pradesh State Aid to Industries Rules, 1971 Industries Department Notification, dated the 22nd February, 1973: In exercise of the powers conferred by Section 46 of the Himachal Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971), the Governor, Himachal Pradesh made the rules for the purposes of the said Act, the same having been previously published vide this Government notification of even number, dated the 19th January, 1973. It describes the procedure for Application for State Aid Loans.

Himachal Pradesh State Aid to Industries Rules, 1972, Date of Commencement of the Act, Industries Department Notification No. 9-7/71-SI (Loans): In exercise of the powers conferred by Sub-section (3) of Section 1 of the Himachal Pradesh State Aid to Industries Act, 1968 (2 of 1971), the Himachal Pradesh Government, hereby, appoints the 19th January, 1973 as the date on which the said Act shall come into force.

Constitution of the Board, Industries Department Notification, Dated the 31st August, 1973: The Governor, Himachal Pradesh, constituted a Board to be called the 'Board of Industries' consisting of the following members for carrying out the purposes of the Himachal Pradesh State Aid to Industries Act, 1968 (Act No. 2 of 1971).

Rules Regarding Grant of Incentives, Concessions and Facilities to Industrial Units in Himachal Pradesh, 2004: The objectives of the incentives, concessions and facilities being provided under these Rules are to: achieve the aims and objectives announced by the Government in the Industrial Policy Guidelines from time to time; spell out the extent to which the State Government proposes to provide benefits, incentives, concessions and facilities to industrial enterprises to be set up in the State, on or after the appointed day; supplement and support the Special Package of Incentives and Concessions announced by the Government of India on 7th of January, 2003 for industrial enterprises to be set up in Himachal Pradesh; encourage investment and optimum utilisation of the resources of the State, namely, power, land, capital, manpower and raw material in terms of revenue generation and generation of employment opportunities for local populace within the physical and environmental carrying capacities of the State; facilitate the ease of doing business by simplifying the Rules and to promote transparency of procedures governing the establishment of Industrial Enterprises in

the State; and encourage the maximum gainful employment of bona fide *Himachalis* in the Industrial Enterprises set up in the State.

The Himachal Pradesh *Khadi* and Village Industries Board Act, 1966: The Act provides for the establishment of Board for the development of *Khadi* and village Industries in the four areas (as comprised in Himachal Pradesh immediately before 1st November, 1966). The functions of the Board are to: promote, encourage and assist in the development of *khadi* and village industries and to carry on trade or business in the products of such industries; provide work to persons who have been professionally engaged in *khadi* and village industries; grant loans to individuals societies or institutions engaged in *khadi* and village industries on such terms as may be prescribed; encourage establishment of co-operative societies in *khadi* and village industries; conduct training centres with a view to impart the necessary skill and knowledge for carrying on *khadi* and village industries; manufacture tools and implements and to arrange supply of such tools and implements and raw materials in order to secure development of *khadi* and village industries; conduct publicity and propaganda and to organise marketing of finished product of *khadi* and village industries by opening stores, shops, emporia and exhibitions; undertake and encourage research with a view to improve the quality and marketability of *khadi* and the products of village industries; collect statistics relating to *khadi* and village industries from such person or persons as may be prescribed and to publish the statistics so collected; and carry out other matter, which may be prescribed.

The Himachal Pradesh Co-operative Societies Act, 1968: The Act regulates registration with limited or unlimited liability; restrictions on holding of shares; societies to be corporate bodies; amendment of bye-laws of a Co-operative society; amalgamation, transfer of assets and liabilities; conversion and division of societies; cancellation of registration certificate of Co-operative societies in certain cases; restriction on transfer of shares or interest; transfer of interest on death of a member; disposal of share or interest of expelled, resigned or insane member; members to furnish information as to their financial position and alienation of their immovable property; nominees of the Government on the committee of Co-operative society; charge on immovable properties of members borrowing loans from certain societies; acts of Co-operative societies not invalidated by certain defects; liability of a Government servant in connection with the affairs of a Co-operative society; savings of existing society and appointment of a Co-operative Appellate Tribunal.

Recycled Plastics (Manufacture and Usage) Rules, 2003: As per the provisions of the Recycled Plastics Manufacture and Usage Rules, 2003, every occupier manufacturing carry bags or containers of virgin plastic or recycled plastic or both shall have to get registered with the State Pollution Control Board.

Other Sub-Programmes/ Strategies / Projects

Zoning Atlas and Associated Activities: Apart from its regulatory role, the State Pollution Control Board is undertaking a pro-active visionary approach by making use of scientific tools, such as Geographic Information System (GIS) application for environment management etc. To undertake the Spatial Environmental Planning Programme, the State Board has a state of art facility in terms of infrastructure and technical manpower. It has so far covered all the districts under Zoning Atlas for siting of industries. In addition, the State Board has also taken lead towards revising all these zoning atlases as per the modified criteria devised by the Central Pollution Control Board and the Ministry of Environment and Forests, Government of India, and consequently, more sites are available now for sustainable industrialisation. The summary of the activities undertaken/being undertaken by the State

Board in order to achieve the objectives of sustainable industrialisation are as follows:

1. Zoning Atlas for siting of industries for all districts of the State.
2. Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan and Paonta Sahib in Sirmaur.
3. State Environmental Atlas of Himachal Pradesh.
4. District-wise Environmental Atlas for Solan, Sirmaur, Kangra, Mandi and Hamirpur and remaining districts are also being covered.

The Central Pollution Control Board in consultation with State Pollution Control Boards has identified 24 areas in the country as critically polluted areas. In Himachal Pradesh, Kala-Amb and Parwanoo are identified as critically polluted areas.

Special Package of Incentives for Himachal Pradesh: In January 2003, the Government of India announced a special package of incentives to Himachal Pradesh. This includes 100 percent exemption from payment of Central Excise Duty for 10 years, 100 percent income tax exemption for five years and 25 and 30 percent exemption for the next block of five years (for Individuals and Companies), capital investment subsidy @ 15 percent of investment in Plant and Machinery subject to a ceiling of Rs. 30 *lakhs*, and enhancement of funding pattern under centrally sponsored schemes, like *Deen Dayal Hathkargha Protsahan Yojana* and Prime Minister *Rojgar Yojana*. Apart from these, the Central Transport Subsidy is being provided to industrial units @ 75 percent of the cost of transportation of their finished goods and for transportation of their raw material from the location of their units anywhere in the State to the nearest, specified broad gauge rail head.

The Centre has also announced a special package of incentives for Himachal Pradesh and Uttarakhand, broadly along the lines of Jammu and Kashmir. It provides for concessions aimed at attracting new investments to these States. It will be a conscious Policy of the Government to supplement this package with certain concessions and facilities from the State Government so as to ensure sustainable industrial development in the long run.

The State Government has set up a State Level Single Window Clearance and Monitoring Authority under the chairmanship of the Chief Minister to consider and give Government approvals in principle to the medium and large scale projects in the State and to ensure optimum Inter-Departmental co-ordination. The State has also set up Single Window Agencies at major industrial towns, like Parwanoo, Baddi, Paonta Sahib, Goalthai and Sansarpur Terrace to facilitate speedy clearances and assist entrepreneurs in obtaining various clearances to set up their projects. The State Government, through these Single Window Agencies, will not only ensure initial approvals to set up the project, but also look into the requirements of obtaining further licenses necessary to commence production. It will also assist in obtaining all necessary State Government Department related approvals from the concerned Departments. To facilitate clearances and monitoring of projects in the State and to make it transparent and user-friendly, these Agencies will be actively encouraged to use IT in their working and discharge of their functions. The services being offered by these Agencies would be adequately highlighted through Industrial Associations and fora like PHDCCI, FICCI, ASSOCHAM, CII etc. as channels for providing information to industry. The State Government would actively consider preparing and finalising a separate framework for effective implementation of the Single Window System with a view to make Single Window Clearances a statutory requirement.

Health Vision, 2008: The Health Vision, 2008 envisages the vision of the State, the targets to be attained and a guiding agenda to frame the strategy and tactical tools for attainment of targets. The primary goal of Vision 2008 is to achieve the status-Health for All.
Roadmap 2008 document also mentions that

as part of good governance practices, the State shall initiate and strengthen existing systems to address environmental health issues in the State, particularly liquid waste disposal, hospital bio-medical waste management, solid waste management and excreta disposal.

Ongoing initiatives of NAPCC: Power Generation - The Government is mandating the retirement of inefficient coal-fired power plants and supporting the research and development of IGCC and supercritical technologies. Renewable Energy - Under the Electricity Act 2003 and the National Tariff Policy 2006, the Central and the State electricity regulatory commissions must purchase a certain percentage of grid-based power from renewable sources. Energy Efficiency - Under the Energy Conservation Act 2001, large energy consuming industries are required to undertake energy audits and an energy labelling programme for appliances has been introduced.

Scheme for Support to Public Private Partnerships in Infrastructure (Viability Gap Funding), Government of India: This scheme will be called the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure. It will be a Plan Scheme to be administered by the Ministry of Finance. In order to be eligible for funding under this Scheme, a PPP project shall meet the following criteria: (a) The project shall be implemented, i.e., developed, financed, constructed, maintained and operated for the project term by a Private Sector company to be selected by the Government or a statutory entity through a process of open competitive bidding; provided that in case of railway projects that are not amenable to operation by a Private Sector company, the Empowered Committee may relax this eligibility criterion; (b) International Convention Centres and other tourism infrastructure projects; provided that the empowered committee may, with approval of the Finance Minister, add or delete sectors/sub-sectors from the aforesaid list.

The total Viability Gap Funding under this scheme shall not exceed twenty percent of the total project cost; provided that the Government or statutory entity that owns the project may, if it so decides, may provide additional grants out of its budget, but not exceeding a further twenty percent of the Total Project Cost. Viability Gap Funding under this scheme will normally be in the form of a capital grant at the stage of project construction.

Viability gap funding up to Rs. 100 *crores* (Rs. One Hundred *Crores*) for each project may be sanctioned by the Empowered Institution subject to the budgetary ceilings indicated by the Finance Ministry. Proposals up to Rs. 200 *crores* (Rs. Two Hundred *Crores*) may be sanctioned by the Empowered Committee, and amounts exceeding Rs. 200 *crores* may be sanctioned by the Empowered Committee with the approval of the Finance Minister.

The Draft Himachal Pradesh Industrial Renewal and Revival Scheme, 2004: The 2004 Scheme will be operated by Department of Industries of the Government of Himachal Pradesh for the rehabilitation or revival of industrial units in the State. The 2004 Scheme shall be applicable to all 'Closed'/'Sick'/'Weak' units as defined, proposing the rehabilitation or revival of such Units and also to the expansion in respect of registered 'Closed', 'Weak' or 'Sick' Units if forming a part of such rehabilitation or revival proposals as accepted by the State Government.Such registered Units can be in the Private Sector, co-operative sector and or joint sector.

Incentives disbursed to such Units under any earlier Incentive Schemes shall continue to be governed by the provisions of the registration and sanctions already issued under the respective Schemes. Provided further that sick Units that have been registered and for which eligibility certificates have been issued in terms of any other Incentives Scheme, but in respect of which no Incentives have been actually disbursed, may opt for registration under the 2004 Scheme, if the rehabilitation or revival

proposals otherwise fulfill the terms and conditions under the 2004 Scheme.

Centrally Sponsored Schemes

Transport/Freight Subsidy: This is a 100 percent Centrally sponsored scheme wherein the eligible industrial units are given subsidy @ 75 percent on the transportation costs paid on raw materials and finished goods from the location of the unit to the nearest railway heads and vice-versa. It is applicable to all eligible industrial units for a period of five years from the date of commencement of commercial production. Prior to 2004-05, this scheme was being implemented on the basis of 100 percent reimbursement from Government of India. This scheme was to continue up to 31.3.2007, but now this scheme has been extended further. Himachal Pradesh State Industrial Development Corporation (H.P.SIDC) has been declared as nodal agency for disbursement of claims on account of transport subsidy – under this scheme.

Central Capital Investment Subsidy: The Government of India has announced a Special Package of Incentives for Himachal Pradesh on 7.1.2003 wherein all the new industrial units in notified locations are eligible for capital investment subsidy @ 15 percent of their investment in plant and machinery subject to a ceiling of Rs. 30.00 *lakhs*. The existing units are also entitled to this subsidy on their substantial expansion.

Deen Dayal Hathkargha Protsahan Yojana: The *Deen Dayal Hathkargha Protsahan Yojana* is a Centrally sponsored handloom scheme introduced in 2000-01. This scheme has replaced the project package scheme. This is a Centrally sponsored scheme shared by the Centre and State on 50:50 basis (90:10 for certain components like training to weavers, margin money, design development etc.). In case of implementing agencies where 100 percent beneficiaries belong to SC/ST/Women/Minority category, the funding pattern is 75:25 (Centre: State). As per the new package of incentives announced by the Government of India to Himachal Pradesh on the pattern of North-Eastern States, Jammu & Kashmir and Uttarakhand the funding pattern has been changed to 90:10 (Centre:State).

Work Shed: This is a Centrally sponsored scheme, which is being funded by the Centre and the State on sharing basis in the ratio of 7:1. Under this scheme, financial assistance is being provided to rural weavers, who have no proper working place and earn at least 50 percent of his earnings from weaving, for construction of work-shed. Initially, the funding pattern of this scheme was 80:20, which was revised as 87.5:12.5. Under this scheme, for a work-shed costing Rs. 9000, Rs. 7000 are provided by the Government of India, Rs. 1000 by the State Government and Rs.1000 by the beneficiary.

Office Memorandum No. 1 (10)/2001-NER Government of India, Ministry of Commerce and Industry (Department of Industrial Policy and Promotion), New Delhi, Dated 7th January, 2003: The memorandum is concerned with the New Industrial Policy and other concessions for the States of Uttarakhand and Himachal Pradesh. It provides the following package of incentives for these two States. The memorandum outlines fiscal incentives to new industrial units and to existing units on their substantial expansion; development of Industrial Infrastructure; and other incentives including *Deen Dayal Hathkargha Protsahan Yojana* and other incentives of the Ministry of Textiles. The funding pattern between Government of India and both the States would be changed from 50:50 to 90:10 under this Scheme. The Ministry of Textiles would extend its package of incentives to Himachal Pradesh, which is included in the difficult area category, Ministry of Food Processing Industries, *Pradhan Mantri Rozgar Yojana (PMRY)*. Ministry of Agro and Rural Industries would provide for the State of Himachal Pradesh relaxation under PMRY with respect to Age (i.e., 18-40 years from 18-35 years) and Subsidy (@ 15 percent of the

project cost subject to a ceiling of Rs.15,000/- per entrepreneur).

The memorandum mentions locations identified under the new Industrial Policy for the States of Uttarakhand and Himachal Pradesh in Annexure 1. It mentions existing identified industrial locations where infrastructure has been developed through Government / Government owned Corporations / Boards in Himachal Pradesh. These are Bilaspur Sadar, Hamirpur, Nadaun, Perri, Baldwara, Nahan, Dulehar, Kangra, Jawali, Nagrota Bagwan and Dehra. These are as per Enclosure 1, which gives the names of the industrial area/estate district-wise.

Commercial estates on private/leased lands throughout the State include Indora, Gagal, Dharamshala, Gangath, Tapri in Kangra district; Tapri, Nichar in Kinnaur district; Bhunter, Ujhi, Kullu in Kullu district; Aut, Dehar, Bagshar in Mandi district; Darlaghat, Kasauli, Dharampur in Solan district; Paonta Sahib, Rajgarh in Sirmaur district; Gagret in Una district; Rawla Kwar, Sarahan, Sunni in Shimla district; and Salooni in Chamba district.

New locations include Bahadurgarh, Ghumarwin, Kuthera, Balseena in Bilaspur district; Panjala, Banikhet, Chowari, Sihunta in Chamba district; Bijri, Nalti, Taal, Sujanpur-I, Bamson in Hamirpur district; Raja Ka Talab, Palampur in Kangra district; Moorang in Kinnaur district; Banjar, Sainj in Kullu district; Dhellu, Sundernagar, Chauntra, Gopalpur, Nachan, Tungal, Darang Sira in Mandi district; Theog, Jutogh, Rohru in Shimla district; Majra, Kamrao in Sirmaur district; Changar, Solan, Kandaghat, Arki, Patta in Solan district; and Daulatpur, Ishpur, Una, Chururu in Una district.

There are 14 thrust industries for Himachal Pradesh, namely, Floriculture, Medicinal herbs and aromatic herbs etc. – processing; Honey, Horticulture and Agro based industries, such as Sauces, Ketchup etc.; Fruit juices and pulp, Jams, Jellies, vegetable juices, puree, pickles etc.; preserved fruits and vegetables, processing of fresh fruits and vegetables including packaging, processing, preservation, packaging of mushrooms; Food Processing Industry excluding those included in the negative list; Sugar and its by-products; Silk and silk products; Wool and wool products; Woven fabrics (Excisable garments); Sports goods and articles and equipment for general physical exercise and equipment for adventure sports/activities; tourism (to be separately specified); Paper and paper products excluding those in the negative list (as per excise classification); Pharma products; Information and Communication Technology Industry, Computer hardware, Call centres; Bottling of mineral water; Hotels, resorts, spa, entertainment/amusement parks and ropeways; Industrial gases (based on atmospheric fraction); Handicrafts and Non-timber forest product based industries.

Annexure - III of the Memorandum categorises 20 activities in the negative list for Himachal Pradesh. These activities are: Tobacco and tobacco products including cigarettes and pan masala; Thermal Power Plant (coal/oil based); Coal washeries/dry coal processing; Inorganic Chemicals excluding medicinal grade oxygen (2804.11); Medicinal grade hydrogen peroxide (2847.11); Compressed air (2851.30); Organic chemicals excluding Pro-vitamins/vitamins; Hormones (29.36); Glycosides (29.39); Sugars* (29.40) (Reproduction by synthesis not allowed as also downstream industries for sugar); Tanning and dyeing extracts; Tannins and their derivatives; Dyes, colours, paints and varnishes; Putty, fillers and other mastics; Inks; Marble and mineral substances not classified elsewhere; Flour mills/rice mill; Foundries using coal; Minerals fuels; Mineral oils and products of their distillation; Bituminous substances; mineral waxes; Synthetic rubber products; Cement clinkers and asbestos, raw including fibre; Explosive (including industrial explosives, detonators and fuses, fireworks, matches, propellant powders etc.); Mineral or chemical fertilisers; Insecticides, fungicides, herbicides and pesticides (basic manufacture and formulation); Fibre glass and articles

thereof; Manufacture of pulp - wood pulp; Mechanical or chemical (including dissolving pulp); Branded aerated water/soft drinks (non-fruit based); Paper (writing or printing) paper etc., paper or paperboard, etc., Maplitho paper etc., newsprint, in rolls or sheets, craft paper etc., sanitary towels etc., cigarette paper, and grease-proof paper. Toilet or facial tissue etc., paper and paper board, laminated internally with bitumen, tar or asphalt, carbon or similar copying paper, products consisting of sheets of paper or paperboard, impregnated, coated or covered with plastics, etc., paper and paperboard, coated impregnated or covered with wax, etc.) and plastics and articles thereof.

Land Bank: The Department of Industries has identified land in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts of the State and has constituted a Land Bank comprising private land totalling **5089-09 *bighas*** and Government land totalling **1771-17 *bighas,*** which are available for setting up of Industries. The private land comprises of such lands whose owners have consented to sell their land to private entrepreneurs through mutual negotiation. The Department of Industries, Government of Himachal Pradesh, will provide escort and facilitation services in case the entrepreneurs are willing to purchase such private land.

In January 2010, Central Pollution Control Board (CPCB), in association with Indian Institute of Technology (IIT), New Delhi have carried out an environmental assessment of industrial clusters across the country based on Comprehensive Environmental Pollution Index (CEPI) with the aim of identifying polluted industrial clusters and prioritising planning needs for intervention to improve the quality of environment in these industrial clusters and the nation as a whole. The assessment so carried out has been documented in the form of a report entitled 'Comprehensive Environmental Assessment of Industrial Clusters'. In all 99 industrial clusters have been assessed. The report has concluded that the industrial clusters/areas having aggregated CEPI scores of 70 and above should be considered as critically polluted; the clusters/areas having CEPI scores between 60-70 should be considered as severely polluted areas. Baddi, Kala Amb and Parwanoo in Himachal Pradesh, fall under this category and shall be kept under surveillance and pollution control measures should be efficiently implemented; and the critically polluted industrial clusters/areas need further detailed investigations in terms of the extent of damage and formulation of appropriate remedial action plan. The developmental projects from industrial clusters with CEPI score between 60-70 (as listed at Serial No. 44 to 75 of the Annexure), which are in the pipeline or are received for grant of environmental clearance in terms of the provisions of EIA Notification, 2006 [including projects for stage-I clearance, i.e., scoping (TORs)], will be considered following the procedure outlined in MoEF's earlier Circular No.11013/18/2009-IA.II (I) dated 25th August, 2009 relating to "proposals for environment clearance for the projects located in the critically polluted areas as identified by the Central Pollution Control Board."

Guidelines for Common Hazardous Waste Incineration, Central Pollution Control Board (CPCB)

Hazardous wastes generated by the industries are required to be managed as per the Hazardous Waste (Management and Handling) Rules, 1989, as amended. About 4.4 percent of hazardous waste generated in the country is of the nature, which has to be incinerated. Besides, segregated organic residues, highly concentrated effluents, such as mother liquors and toxic effluents not feasible for physico-chemical, biological treatment also require proper disposal through incineration. The Guidelines prepared by CPCB cover common incineration facilities, transportation of hazardous waste, storage of hazardous waste, waste feeding mechanisms, combustion chambers (rotary kiln and secondary combustion chamber), pollution control devices, monitoring and on-line display requirements, ash/slag management,

quench/scrubber liquor management and other requirements.,

Ministry of Environment and Forest (MoEF)'s Charter on 'Corporate Responsibility for Environmental Protection (CREP)' March, 2003. The Charter was launched with the purpose to go beyond the compliance of regulatory norms for prevention and control of pollution through various measures including waste minimisation, in-plant process control and adoption of clean technologies. The Charter has set targets concerning conservation of water, energy, recovery of chemicals, reduction in pollution, elimination of toxic pollutants, process and management of residues that are required to be disposed off in an environmentally sound manner. The Charter enlists the action points for pollution control for various categories of highly polluting industries. A Task Force was constituted for monitoring the progress of implementation of CREP recommendations/action points.

Guidelines for Adoption of Clean Technology, Ministry of Environment and Forest, (MoEF), Government of India (GoI).

Adoption of cleaner modes of production helps in resource conservation and elimination of gaseous, liquid or solid wastes. Clean technology entails:

- waste prevention and reduction by reduced consumption of raw materials,
- modification and upgradation of the technological processes so that optimal utilisation of natural resources is made possible,
- adoption of preventive rather than corrective approaches to pollution control

To encourage identification, acquisition, development and promotion of cleaner technologies at all levels, a network of Clean Technology Centres need to be set up, with a National Centre coordinating their activities. A Centre for Clean Technology should be able to carry out the following:

- identify the areas where introduction of clean technologies is possible;
- Identify the source(s) from where clean technology and data/details thereof can be obtained;
- Assess the technology available indigenously as well as those to be imported;
- Modify the technology if necessary and demonstrate it to the satisfaction of the users so that it can be replicated;
- Undertake Research and Development to develop technologies for cleaner production;
- Collect, Collate and disseminate information on clean technology; and
- Maintain interaction with the industry, financial institutions and Research and Development Laboratories for adoption of clean technologies.

Discussion with the concerned Departments under Government of India, industry associations, research organisations and financial institutions have recommended the setting up of a sectoral 'Clean Technology Centre' dealing with coal mining, beneficiation, transportation, utilisation and waste disposal at the earliest.

In the pulp and paper manufacturing sector, several clean technologies, such as anaerobic treatment, lignin recovery etc. can be adopted for pulp and paper production as the success of these efforts has been established with pilot plant tests. Other examples of clean technologies relate to the use of lignin to develop value added products, use of fly-ash generated during burning of lignin for brick-making and reduction in raw material consumption.

Hazardous Waste Management Guidelines, MoEF, Government of India

In order to have a proper control over hazardous waste management, the regulatory

authorities should specify the occupier or generator of hazardous waste:

1. To keep a complete record of the types, quantities and characteristics of hazardous waste; to segregate hazardous waste at source from non-hazardous waste; to transport hazardous waste only through the specified and registered transporters; to fulfill the pre-transport requirements before transporting hazardous waste; and to dispose of hazardous waste only at the notified disposable facilities.
2. The regulatory authorities shall ask the occupier or generator to submit quarterly reports.
3. The authorities should ensure that the occupier/generator sends a copy of the manifest to them as soon as the hazardous wastes are shipped for ultimate disposal.
4. The regulatory authorities may allow the occupier/generator to store his hazardous waste on-site provided that:

    - The waste is stored in the specified containers and occupier/generator follows the requirements for storing in the containers.
    - The date upon which each period of storage begins is clearly marked and visible on each container.
    - While being stored on-site, each container is labelled or marked with the words 'Hazardous Waste', both in English and respective local language.

5. The regulatory authorities may allow the occupier/generator to store maximum quantity of 10,000 kgs or a truckload, whichever is less, of hazardous waste on-site for a maximum period of 90 days.
6. If an occupier/generator generates less than 1,000 kgs of hazardous waste in a month, he may be considered as a small quantity generator. Such type of generators may be allowed to store their waste on-site for a maximum period of 180 days. In any case, the quantity of waste should not exceed 6,000 kgs at any given point of time.
7. The regulatory authorities may provide an extension to the storage period to the occupier, on case-by-case basis, provided that:

    - An occupier/generator who generates less than 1000 kgs of hazardous waste in a month and who transports his waste across a distance of more than 500 kms for off-site storage, treatment and/or disposal may be allowed to store hazardous waste on-site for a maximum period of 270 days at the discretion of regulatory authorities.
    - In any case, the quantity of waste should not exceed 10,000 kgs at any given point of time.

8. To ensure that the occupier/generator disposes their waste only in the notified disposal facilities.
9. In case of any unforeseen, temporary, and uncontrollable circumstances, the regulatory authorities may grant an extension of a maximum period of 30 days to the 90 day or 180 day or 270 day on-site storage period, after receiving written application from the occupier/generator.
10. An occupier/generator, who generates less than 1000 kgs of hazardous waste or more than 10,000 kgs or stores hazardous waste for more than 90 days or 180 days or 270 days, as the case may be, should be considered as an operator of a storage facility, unless an extension has been provided by the regulatory authorities.
11. An occupier may be allowed to store not more than one day's quantity of semi-solid hazardous waste at a time in containers near the source/point of generation, which is under the control of the operator generating the waste. In any case, the container should have marking of the words 'hazardous waste' both in English and respective local language.
12. At all times, there must be at least one employee either on the premises or on call with the responsibilities for co-ordinating all emergency response measures.

13. To inspect the on-site storage areas for proper storage.
14. In order to track the hazardous waste from the source of generation to the final disposal points, the regulatory authorities should introduce the manifest system. This system should not only help the regulatory authorities in tracking the hazardous waste, but also ensure the safe disposal of the waste. The manifest system would serve as a 'chain of custody' document. Every time the shipment changes hands, the responsible persons sign the manifest.

Guidelines for Transportation of Hazardous Waste

- Transportation of hazardous waste being the important link in hazardous waste management system, it requires precise control to ensure safe disposal of such wastes. Therefore, it would be prudent to consider registering the transporters of hazardous waste with the Department of Environment and Forests in addition to the Department of Transport. This would enable the Ministry of Environment and Forests/respective State Pollution Control Boards to ensure safe and secured transport of hazardous wastes.
- To ensure that the occupier/generator transports his hazardous waste only in the specified transport vehicles.
- The transporters should be asked to train the drivers and helpers of hazardous waste transport vehicles to handle the wastes under emergency situations.

Guidelines for Owner/Operator of Hazardous Waste, Treatment, Storage and Disposal Facility (TSDF)

Licensing system: The regulatory authorities may issue a consent to an owner/operator of a facility, who can demonstrate his technical, financial and managerial competence and that his staff are properly trained. The authorities shall specify in the consent, the wastes which a facility can receive; the operational conditions, which must be met; the monitoring and control procedures to be carried out; and the records, which must be kept. Along with the application for consent, the following information should be furnished by the owner/operator of a facility:

- Area required for the facility.
- Types of wastes to be handled, stored, treated and/or disposed.
- Facilities available for managing these wastes.
- Environment Impact Assessment of the area where the activity has been proposed.
- Contingency plan of the facility.

The regulatory authorities should ensure that the owner/operator of a facility has all necessary equipments, such as fire control equipments, decontamination equipment, water spray system and internal communication or alarm systems capable of meeting any emergency situation at the facility.

Establishment of standards: The regulatory authorities should identify the Principal Organic Hazardous Constituents (POHC) in the waste and fix up standards for stack emission for POHC from the incinerator.

Also the effluent and groundwater quality should be monitored regularly. The records of the facility should be checked regularly.

Post-closure care and use of property: The post closure-care for each hazardous waste storage, treatment, and/or disposal facility should begin after closure of the facility and the regulatory authorities must ensure that the post closure continues for 30 days from the date of closure. The local or State Administrative body should be made responsible for the post-closure care.

To ensure that the copy of the manifest reaches the authorities after receiving the hazardous waste from the occupier/generator. The owner/operator should indicate the proposed treatment and disposal scheme to be followed for the hazardous waste. The copy of

the manifest should be linked with the copy of the manifest sent by the occupier/generator.

Guidelines for Submission of Proposals under the Scheme Waste Minimisation in Small and Medium Industries (SMIs), MoEF, Government of India

The activities to be undertaken include identification of the industrial sectors, which have the possibility of reducing the waste generated within the existing operation, leading to conservation of resources; identification of clusters of small and medium scale industries and the units willing to adopt the waste minimisation approach, profile the sector/cluster/units giving information on the raw material consumption, waste generation including the existing treatment and disposal methods, feasibility study of implementing the waste minimisation schemes for selected sectors/clusters/units, demonstration of the waste minimisation in one or more units through actual implementation of the waste minimisation options/solutions and conducting workshops for entrepreneurs bringing out the salient features of waste minimisation measures that can be adopted/replicated.

Chapter 3: Environmental and Social Issues of Sectors

3.0 Tourism, Art and Culture

As per Ministry of Tourism, Government of India estimates, Shimla, Kullu, Kangra and Bilaspur are expected to be the top five tourist destinations accounting for more than 70 percent of tourists arrival till 2021. It is expected that Kullu and Kangra districts, and Bilaspur and Chamba districts will compete with each other to attract tourists arrival. Lahaul and Spiti district is expected to remain the lowest in attracting tourists arrival.

Vulnerability analysis at *tehsil* level indicates highest pressure in Bilaspur *Sadar*, Chamba, Sujanpur Tira, Kangra, Kalpa, Kullu, Spiti, Jogindernagar, Shimla Rural, Nahan, Kasauli, Amb, Haroli and Bharwain.

Other *tehsils* where high pressure have been observed include Naina Devi ji, Ghumarwin, Salooni, Dalhousie, Nadaun, Hamirpur, Dharmshala, Baijnath, Palampur, Neerpur, Manali, Ani, Sarkaghat, Baldwa, KumarsainTheog, Paonta Sahib, Renuka, Pachhad, Rajgarh, Rameshahar, Nalagarh, Arki and Una.

Changes in Land-use/Aesthetics and Inadequate Tourist Infrastructure: The expected demand and supply gap in terms of bed requirement and bed available at the top five tourist destinations will exceed 50,000 in 2011 and 1,00,000 in 2021. This translates into an additional 62 ha and 127 ha of built up area and 106 ha and 201 ha of total area requirements by 2011 and 2021 respectively in these district. The additional requirement of built up area will lead to land use change as well as infrastructure development.

Inadequate availability of Safe Drinking Water at Tourist Destinations/Circuits and Tracker Routes: The expected additional water supply demand due to tourist arrivals will exceed 1059 mld in 2012 and 1630 mld in 2021 in the top five tourist destinations. Vulnerability analysis shows that water supply infrastructure in Shimla, Kangra, Chamba districts and Kullu, Ghumarwin in District Bilaspur, (*sadar tehsils)* Districts is already under stress. Additional tourist load will increase pressure on existing water supply system.

Inadequate Sanitation at Tourist Units/Destinations/Circuits, Religious Places, Heritage Sites, Trekking Routes, and Transportation Routes: The additional sewage generation due to tourist arrivals is expected to exceed 847 mld in 2011 and 1338 mld in 2021 in the top five tourist destinations. Vulnerability analysis shows that sewage infrastructure in Shimla, Kangra, Chamba districts and Kullu, Ghumarwin in Bilaspur District (*sadar tehsils)* Districts is already under stress. Additional tourist load will increase pressure on existing sewerage infrastructure.

Solid waste littering and improper disposal along trekking routes, tourist circuits and tourist destination e.g. plastic waste, pet bottles, tetra-packs, packets of snack food, food items and batteries from cameras/audio/video equipments. The expected additional Municipal Solid Waste generation due to tourist arrivals will exceed 3479 tons per day in 2011 and 5354 tons per day in 2021 in the top five tourist destinations. Vulnerability analysis shows that MSW infrastructure in Shimla, Kangra, Chamba districts and Kullu, Ghumarwin in Bilaspur District and Bilaspur (*sadar tehsil)* Districts is already under stress. Additional tourist load will add pressure on existing Municipal Solid Waste Management infrastructure.

Increased Emissions due to Increased Traffic at Tourist Destination/Circuits/Routes, Heritage Sites, Religious Places: The additional transportation requirement due to tourists arrival is expected to exceed 10952 PCUs (Passenger Car Unit) per day in 2011 & 15945 PCUs (Passenger Car Unit) per day in 2021 during peak season in the top five tourist destinations. Considering Bharat Stage-II

norms, the additional average daily CO load is expected to exceed 116 kg/day in 2011 and 146 kg/day in 2021 in these destinations. Similarly, the additional average daily HC load is expected to exceed 27 kg/day in 2011 and 34 kg/day in 2021 in these destinations.

Disruption of Electricity Supply at Tourist Destinations During Tourist Season: The additional electricity demand is expected to range from 23,279 MWH to 11,03966 MWH in 2011 and 2,86,176 MWH to 15,16,565 MWH in 2021 in the top five tourist destinations.

Disturbance to Ecology and Critical Habitats due to the Development of New Tourist Circuits/Units/Destinations: Uncontrolled and unregulated tourism in new tourist areas/circuits/units/destinations, ecologically sensitive areas, forests, villages, hills and mountains offer potential of disturbance to ecology/critical habitats.

Unregulated Activities/Encroachments at Tourist/Heritage/Pilgrimage Sites: Land encroachments by *dhabas* and vehicles at transit points offer major constraints to existing congested space.

Buffer zone activities like camping near water bodies/sources/lakes, rekindling of bon fire at campsites, washing of clothes and vehicles are a major source of air and water pollution.

Illegal collection of medicinal herbs and other species of flora and fauna in forest areas leads to biodiversity loss.

Theft and pilferage of idols/other items of heritage value lead to loss of heritage.

Inadequate Awareness, Training and Capacity Building about Environmental Issues Related to Tourism: The State is still in the process of developing capacity in terms of skilled human resources in the area of hospitality/tourism as well as environmental issues related to tourism. This is based on the fact that there is a huge gap in existing tourism infrastructure and the human resources needed to manage it. Further, the existing skill sets of human resources of coordinating and collaborating agencies needs to be upgraded to plan and implement the selected response to address environmental issues.

Lack of Carrying Capacity Studies/Assessments: The growth in tourism in the State does not match with the adequate planning to create infrastructure and facilities in tourist circuits and destinations. This has resulted in congestion of a few tourist circuits/destinations. Recently, the Department of Tourism and Civil Aviation has undertaken the preparation of the Tourism Master Plan to address this issue.

Inadequate Attention on the Preservation of Local Art, Architecture and Culture: Town and Country Planning Department has not adequately planneed to regulate land use in the vicinity of the protected monuments. Inadequate attention is paid when approving the design of the new buildings/infrastructure. These are planned, designed and constructed without adequately considering the local/hill heritage and culture and are also not in uniformity with the local/hill architecture.

Tourism, Art and Culture and cross sector policies and regulatory frameworks at State level show the intent of the State Government to address environmental issues related to the sector. A mapping of the issues, policies, plans, programmes and project frameworks is described in Box 1.

Box 1: Policies/Plans/Programmes Mapped with Issues in Tourism

Issues	Policies/Plans/Programmes
1. Change in land use & aesthetics, inadequate tourist infrastructure in terms of connectivity by road, air/railway. Lack of carrying capacity studies & assessments.	• State's Tourism Policy, 2005 • Schemes for the development of tourist infrastructure & civic amenities.

Issues	Policies/Plans/Programmes
2. Inadequate availability of safe drinking water at tourist destinations, circuits & trekking routes.	• Banning of plastic waste in the State since August, 2009. • Implementation of provisions under Sections 4, 5, 7, 8 & 9 of the Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995. • Installation of Water dispenser at tourist places.
3. Inadequate sanitation at tourist units/destinations/ circuits, religious places, heritage sites, trekking & transportation routes.	• State's Tourism Policy, 2005 promotes environmentally sustainable tourism. • Ecotourism Policy, 2005 promotes tourism while putting in place adequate safeguards to protect natural resources.
4. Solid waste littering and improper disposal along trekking routes, tourist circuits and destinations, e.g., plastic waste, pet bottles, tetra-packs, packets of snack food, food items and batteries from cameras / audio / video equipments	• State level Tourism Master Plan and area specific Master Plans to be implemented by the Department of Tourism and Civil Aviation & Tourism Development Councils. • Schemes for carrying out survey & development of civic amenities. • Schemes for the development of tourist infrastructure. • The Homestay scheme, 2008. • Implementation w.r.t. Section of Non –biodegradable garbage Control Act, 1995.
5. Increased emissions due to increased traffic at tourist destinations/ circuits/ routes, heritage sites & religious places.	• Air quality monitoring programme in urban areas by HPPCB.
6. Disruption of electricity supply at tourist destinations during tourist season.	• Promotion of alternate sources of energy generation, e.g., solar power through *Himurja*.
7. Disturbance to ecology & critical habitats due to development of new tourist circuits, units & destinations.	• Development of State level and area specific Tourism Master Plans. • Implementation of projects for tourism related infrastructure development and civic amenities.
8. Unregulated activities / encroachments at tourist / heritage / pilgrimage sites	• State level & area specific Tourism Master Plans.
9. Inadequate awareness & training about environmental issues related to tourism & lack of capacity to implement environmentally sustainable tourism.	• Promotion and Publicity programme carried out by the Department of Tourism and Civil Aviation. • National level capacity building programmes. • State level Tourism & Eco-tourism policies promote capacity building and inter-department cooperation. • Training programmes by the Department of Tourism and Civil Aviation.
10. Inadequate attention on preservation of local art, architecture & culture	• The Ancient Monuments & Archaeological Sites and Remains Act of 1958 • Citizen's Charter, Ministry of Culture, Government of India • The Himachal Pradesh Ancient & Historical Monuments and Archaeological Sites and Remains Act, 1976 (Act No. 32, 1976) • The Himachal Pradesh Hindu Public Religious Institutions & Charitable Endowments Rules, 1984 • The Himachal Pradesh Town & Country Planning Act, 1977 • Development of Buddhist-Tibetan Culture & Art by Ministry of Culture, Government of India. • Grant-in-aid to Voluntary Organisations/Societies for the development & maintenance of National Memorials, Ministry of Culture, Government of India. • Preservation & Development of Cultural Heritage of the Himalayas.

Pressure on account of increasing gaps and slow implementation of policies, programmes, plans and projects is leading to the emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarised in Table 12.

Table 12: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/ Risks
1. Change in land use/aesthetics & inadequate tourist infrastructure.	• Construction of tourist resorts / hotels / bed capacity and other tourist infrastructure requires additional land. • This land may be created by hill cutting or diversion of forest land. Lack of hotels / accommodations. • Unregulated construction at valley side slope.	• Biodiversity loss. • Soil Erosion. • Increased health risks & unhygienic & unsanitary conditions due to overcrowding.
2. Inadequate availability of safe drinking water at tourist destinations, circuits & trekking routes.	• Due to increased tourist traffic the gap in the availability of safe drinking water has widened, which leads to the usage of untreated water.	• Increase in water borne diseases & health risks.
3. Inadequate sanitation at tourist units / destinations / circuits, religious places, heritage sites and trekking & transportation routes.	• Unregulated sewage discharge and open defecation. • Lack of infrastructure facilities, like latrines at transit points (*dhabas*) and soak pits. • Lack of adequate capacity in the existing sanitation infrastructure. • Non existence of sanitation infrastructure at many of the tourist destinations/units.	• Contamination of the water sources & health risks.
4. Solid waste littering and improper disposal along trekking routes, tourist circuits & destinations e.g., plastic waste, pet bottles, tetra-packs, packets of snack food, food items and batteries from cameras / audio / video equipments.	• Inadequate collection, treatment and disposal of solid waste at tourist units/ destinations / circuits leads to build up of solid waste at these locations. Further, burning of non-biodegradable waste deteriorates air quality.	• Air/Water/Land pollution and associated health risks due to biodegradable, non-biodegradable & hazardous waste disposal. • Degraded aesthetics.
5. Increased emissions due to increased traffic at tourist destinations / circuits / routes, heritage sites and religious places.	• Location specific traffic congestion. • Lack of parking space. • Arrival of much more number of tourists with their own personal vehicles at tourist places.	• Outdoor air quality deterioration and associated health risks.
6. Disruption of electricity supply at tourist destinations during tourist season.	• Increased electricity demand from the grid leading to power shortage and power outages. Increased demand requires accelerated hydro power development.	• Impacts on the ecology of the area on account of new hydro power development to meet demand.
7. Disturbance to ecology and critical habitats due to development of new tourist circuits, units and destinations.	• Uncontrolled and unregulated tourism. • Development of new tourist places in sensitive areas.	• Loss of vegetation due to new routes and diversion of land. • Change in habitat and habitat degradation.

Issues	Causes	Impacts/ Risks
8. Unregulated activities / encroachments at tourist heritage & pilgrimage sites.	• Land encroachment e.g., space occupied for parking of buses / vehicles. • Buffer zone activities/camping near water sources/water bodies/lakes, kindling of fire at campsites, washing of vehicles near water sources. • Illegal collection of endangered species of flora & fauna in forest areas. • Pilferage/loss of items of heritage value. • Bathing in water bodies/lakes/rivers.	• Air & water pollution, biodiversity loss, loss of heritage items & poor aesthetics.
9. Lack of awareness, training and capacity building about environmental issues related to tourism	• Limited reach and extent of awareness campaign due to topography/hilly terrain. • Lack of NGOs/CSOs participation.	• Unchanged consumer behavior leading to continuation of environment unfriendly practices.
10. Inadequate attention on the preservation of local art, architecture & culture	• New buildings/infrastructure are planned, designed and constructed without adequately considering the local architecture, heritage and culture.	• Increase in new buildings / infrastructure, which do not conform to the laid down norms. • Rise in obtrusive buildings / infrastructure, which do not blend with local surroundings. • Risk of such places losing their heritage and potential loss of value of the destinations at tourist circuits/destinations.

3.1 Potable Water Supply

Reduced Water Availability due to Increasing Demand (Population, Tourists): The demands for water, especially for drinking purposes, have a significant impact and this is likely to strain available water resources. The demand for urban areas of the State up to 2021 AD is projected at 150.49 million liters/day. The demand for water in the rural areas is much higher i.e. 575.97 million liters/day by 2021 AD, which is 3.8 times the demand in the urban areas.

A large section of population in the State lacks access to potable water supply. The gap in demand and supply for rural potable water in the State exceeds 2,00,000 kilolitres per day (kld), considering a benchmark of 70 litres per capita per day (lpcd). Similarly, the gap in urban potable water supply in the State exceeds 50,000 kld considering a benchmark of 140 lpcd. *Source: CPHEEO*

At district level, the gap in supply and demand of urban potable water ranges from 1383 kld in districts Bilaspur and Kullu to 27,365 kld in Solan. Further, the gap in rural potable water supply ranges from 822 klpcd in Lahaul and Spiti to 31,000 klpcd in Kangra. These gaps indicate that population in rural areas is more affected by low access as well as shortage of potable water in the State. It also indicates that urban areas have better infrastructure to meet water supply demand in comparison to rural areas.

Water supply in both urban and rural areas of Himachal Pradesh is inadequate in terms of quantity as well as quality. Though all the towns of Himachal Pradesh have water supply facility, yet the per capita availability of water in a large number of towns is well below the desired norms. The major populated towns i.e. Shimla, Solan, Mandi, Hamirpur, Bilaspur and Dharamshala have a per capita water supply of less than 80 lpcd and the industrial towns of

Baddi, Paonta Sahib, and Nalagarh have a per capita water supply of less than 50 lpcd. Not all households have individual water connections in most of the towns and not all localities and areas are covered by the water distribution network due to uneven and hilly terrain. The supply is unreliable due to irregular supply, inadequacy, short duration as well as poor quality of water.

Due to unreliability of the water supply, consumers have installed individual tubewells, storage facilities (ground as well as overhead), booster pumps, pumping sets giving rise to unauthorised tapping and free ridership.

Reduced Water Availability due to Source Over-exploitation, Source Unsustainability and Neglect of Traditional Sources: Perennial springs are not found in the Shivalik due to low water-holding capacity of rock formations. Considerable number of Shivalik villages are fed by a pumping system, which could provide water up to 100 villages. Many schemes were commissioned without sufficient investigation regarding source sustainability. Available sources were used with little planning regarding the possible growth of up-stream water demand. Many irrigation schemes (diversion channels) have been commissioned in Himachal Pradesh, which reduce the down-stream flows, especially during the lean season. Many sources have not been able to supply sufficient water due to: competing up-stream use for agriculture and hydropower; drying up of source; catchment degradation (especially in the Shivalik region).

Reduced Water Availability due to Infrastructure Constraints, e.g., Non-availability of Electricity Supply and Increased Leakage in the Public Distribution System: Dedicated electricity line for distributed pumping stations does not exist. At places with high head, 2-3 stage pumping is required. Failure of any of them cripples the system. There has been a general consensus that there are huge leaks in the installed systems. Further, pipe leakage is a common phenomenon. The water supply systems in most of the towns are quite old and have outlived their utility. Their sources need augmentation and the distribution systems in almost all the supply schemes need replacement and rehabilitation.

Reduced Water Availability due to Lack of Integrated Water Management Strategies /Plans, Monitoring and Funds for Implementation: Very less funds for source augmentation are a major constraint. Demand side management has not been attempted so far. There is no monitoring system for the monitoring of water intake and use in industrial, construction activities, sanitary applications, irrigation and other purposes without assessing carrying capacity/potential.

Reduced Down-stream Flow due to Change in Natural Flow/Hydrology of the Reservoirs / Dams / Hydro-projects: Construction of a large number of reservoirs and dams; diversion of streams and rivers for hydroelectric projects and other purpose; and hydroelectric projects leads to reduced downstream flow into wetlands / water bodies / reservoirs. Further, release of impounded water by dam/reservoirs depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/water body/river. The reduced down-stream ecological flow leads to ecological imbalance in aquatic flora and fauna including fisheries.

Deterioration of Surface and Groundwater Quality due to Contamination: Both surface and groundwater quality is deteriorating due to extensive and severe pollution from industrial, domestic and agricultural sources. The point sources of untreated effluents and sewerage, and diffused sources of pollutants from the use of agrochemicals, deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the State due to unhygienic methods of handling water and unhygienic conditions around traditional water sources. Slaked lime is used to settle water in *Khatris*, but its efficiency in dealing with pathogens is limited due to continuous infiltration of contaminated water. Excess iron

is reported in about 10-15 percent hand pumps of the State (Kangra, Hamirpur, Bilaspur and Sarkaghat area).

Shift in land use and agricultural production patterns in the catchment, buffer zone and fringe areas is leading to adverse impacts on wetlands/reservoirs/water bodies in Himachal Pradesh, e.g., shorelines of lakes/wetlands are cultivated during the draw down phase in Pong reservoir. The water bodies become recipients of insecticides, pesticides, fertilizers and heavy metals. Further, bioaccumulation may lead to potential health risk, e.g., it has been reported in Pong wetland report of Forest Department that chemicals, such as CAN, Urea, 12-32-16, DAP, Sulpher Phosphate and insecticides, such as Nuvan etc. pollute the water of reservoirs and other water bodies which inturn deteriorate the flora and fauna.

Infrastructure development and poor management of waste (municipal solid waste, construction and demolition waste and waste water) in the catchment and vicinity of wetlands/water bodies/reservoirs leads to water pollution and increased influx of organic waste, which further leads to water pollution and eutrophication. Dumping the dung of horses and ponies near wetlands/water bodies/reservoirs due to tourist activities (e.g. Khajjiar) also contributes to water pollution and eutrophication. Increased runoff in the degraded catchment areas of wetlands leads to siltation and weed growth, water pollution and eutrophication. Littering of non-biodegradable materials by pilgrims and tourists increases pollution load in the wetland/water body/reservoir.

Inadequate Sewage Infrastructure and Sanitation Services in the State: At the State level, cases of hospitalisation due to diarrhea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of hospitalisation due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul and Spiti, Mandi, Sirmaur and Una reported increase in hospitalisation due to diarrhea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in hospitalisation due to hepatitis during 1995 to 2002. The gap in rural and urban sewage generation and collection in the State exceeds 1,50,000 kld and 49,000 kld, respectively. At district level, the gap in rural sewage generation and collection ranges from 822 kld in Lahaul and Spiti to 31,060 kld in Kangra. Similarly, the gap in urban sewage generation ranges from 1264 klpcd in Bilaspur and Kullu to 27,365 klpcd in Solan. These gaps indicate discharge of sewage both in rural and urban areas without collection and treatment. *Source: CPHEEO*

The gap in rural and urban Municipal solid waste generation, collection and treatment at State level is about 758 and 185 tonnes per day (tpd), respectively. At district level, it ranges from 4.2 tpd in Lahaul and Spiti to 157.7 tpd in Kangra in rural areas. Similarly, it ranges from 4.8 tpd in Bilaspur and Kullu to 104.5 tpd in Solan in urban areas. The gap in rural and urban biomedical waste generation, collection and treatment at State level exceeds 3 and 1 tpd respectively. In rural areas, this gap ranges from 60 kg per day in Lahaul and Spiti to 709 kg per day in Kangra. Similarly, it ranges from 55 kg per day in Bilaspur, Una to 305 kg per day in Shimla.

Inadequate Community Participation in Rural Water Supply and Sanitation leads to Poor Water Management: Since the State Government has the responsibility for providing water supply, therefore, community initiatives are absent in this regard, even in the areas of severe scarcity. People mostly try to provide water supply for their household needs rather than rejuvenating their traditional water sources. Under difficult terrain and dispersed habitation, managing a water supply can become very expensive if sufficient social development input is not provided. This is one of the main problems now facing the rural water supply scheme in the State.

Since the settlements are dispersed in many areas, each settlement considers itself a community.

Except for representation in the *Panchayat*, there are very few activities that create strong community bonds. Every household in these villages, today has become self centered, having its own priority and very little participation in the community programmes.

Mahila Mandal is present in most of the villages, but community initiative in their formation is absent. The District Rural Development Agency (DRDA) and other Government Departments constitute them for the delivery of their schemes. There are very few NGOs working especially for women issues and water supply and sanitation. Rural people in Himachal Pradesh are fairly individualistic. *Khatris*, for instance, are almost always owned by individual households and investments at community level are limited.

Gaps in Coordination of Institutions Managing Water Sector Leads to Gaps in Operational Efficiency and Financial Realisation: Lack of Private Sector and Panchayati Raj Institutions participation in water supply distribution is indicative of gaps in policy implementation. Besides Panchayati Raj Institutions, water committees are an alternative institutional mechanisms being suggested, though relationship between them and Panchayati Raj Institutions bodies is not yet clearly articulated. Participation of NGOs might be limited on account of their technical deficiencies, while large-scale Private Sector participation is unlikely until new policies are firmly in place. With current level of reliability in water supply, it may be difficult to realise the full tariffs.

There is a growing perception that water cannot be indefinitely provided as a service, however, there is still no clear-cut pricing options available. Differences over modalities of fixing the price of water arise because water is both treated as basic need or service and a commodity. Government policies and regulations on water management have so far been unable to stem the growing problems related to water quality and quantity in Himachal Pradesh. Economic incentives and subsidies have not been beneficial in terms of promoting conservation of water resources. Government subsidies to the irrigation and domestic water supply sectors in the past several decades have allowed for greater expansion and development of both, but have also led to a complete under-valuing of this resource. Groundwater extraction by pumping is indirectly encouraged through subsidies for fuel and electricity. Rural and urban water charges are much lower than the cost of provision and suffer from poor operation and maintenance. The result in all sectors has been higher consumption and insufficient cost recovery.

There is a need to strengthen th current water supply system through IPH. Otherwise, declining water supply distribution from Department of Irrigation and Public Health and handing over distribution from sect oral tank/village tank onwards to village *Panchayats* and urban water supply distribution to the Private Sector would be also be better. It would be a radical shift in policy from the current reliance on IPH alone to enabling the Pries. Revenue collection can also be left to PRIs and the Private Sector.

Water supply sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address inadequate service delivery and quality in order to not only reduce demand and supply gap and disease burden, but also sustain the sector. A mapping of the issues, policy and programme framework is described in Box 2.

Box 2: Policies Mapped with Issues in Water Supply Sector

Issues	Policies/Plans/Programmes
1. Reduced water availability due to increasing demand (population, tourists).	• State Water Policy, 2003 • Tourism Policy, 2005 • HP Municipal Act, 1994 • HP Ground Water Pollution Act, 2005 • HP Town and Country Planning Act, 1977

Issues	Policies/Plans/Programmes
	• *Panchayati Raj* Act, 1994 • State's Sector Reforms, 1999 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
2. Reduced water availability due to source overexploitation, source un-sustainability & neglect of traditional water source.	• *Panchayati Raj* Act, 1994 • State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP Groundwater Pollution Act, 2005 • State's Sector Reforms, 1999 • *Panchayati Raj* Act, 1994 • HP Municipal Act, 1994 • HP Town and Country Planning Act, 1977 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
3. Reduced water availability due to infrastructure constraints, e.g., non-availability of electricity supply & increased leakage in the public distribution system.	• State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP Groundwater Pollution Act, 2005 • State's Sector Reforms, 1999 • *Panchayati Raj* Act, 1994 • HP Housing and Urban Development Authority Act, 2004 • HP Tourism Development and Registration Act, 2002 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
4. Reduced water availability due to lack of integrated water management strategies/plan, monitoring & funds for implementation.	• State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP Forest Sector Policy, 2005 • HP Groundwater Pollution Act, 2005 • HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 • State's Sector Reforms, 1999 • Notification No. IPH-B (C) 10-1/2004 • Notification No. IPH-B (C) 10-3/2004 • Notification No. IPH-B (F) 2-2/2004 • Notification No. IPH-B (F) 5-4/2004 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign

Issues	Policies/Plans/Programmes
5. Reduced downstream flow due to change in natural flow/hydrology of the reservoir/dam/hydro project.	• State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP Forest Sector Policy, 2005 • HP Groundwater Pollution Act, 2005 • HP Municipal Act1994/HP Municipal Bye-Law, 2006 • State's Sector Reforms, 1999 • Notification No. IPH-B (C) 10-1/2004 • Notification No. IPH-B (C) 10-3/2004 • Notification No. IPH-B (F) 2-2/2004 • Notification No. IPH-B (F) 5-4/2004 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
6. Deterioration of surface & groundwater quality due to contamination.	• State Water Policy,2003 • New Hydropower Policy,2006 • River/Stream Bed Mining Policy Guidelines,2004 • Tourism Policy,2005 • HP Groundwater Pollution Act,2005 • Water (Prevention & Control of Pollution) Act, 1974 • State's Sector Reforms, 1999 • HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
7. Inadequate sewage infrastructure & sanitation services in the State.	• State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2004 • HP Groundwater Pollution Act, 2005 • State's Sector Reforms,1999 • Health Vision, 2008 • HP Town and Country Planning Act, 1977 • *Panchayati Raj* Act, 1994 • HP Non-Biodegradable Garbage (Control) Act, 1995 • River/Stream Bed Mining Policy Guidelines, 2004 • HP Municipal Act, 1999/HP Municipal Bye-Law, 2006 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign
8. Lack of community participation in rural water supply & sanitation leads to poor water management.	• State Water Policy, 2003 • New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP Groundwater Pollution Act, 2005 • State's Sector Reforms, 1999 • HP Municipal Act, 1999/HP Municipal Bye-Law, 2006 • *Panchayati Raj* Act, 1994

Issues	Policies/Plans/Programmes
9. Gap in institutional operational mechanism related to water management leads to gap in operational efficiency & financial realisation.	• New Hydropower Policy, 2006 • Tourism Policy, 2005 • HP ground water pollution Act, 2005 • State's Sector Reforms, 1999 • Notification No. IPH-B (C) 10-1/2004 • Notification No. IPH-B (F) 2-2/2004 • Notification No. IPH-B (F) 5-4/2004 • Notification No. IPH-B (F) 0-3/2007 • NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM • Rural Tourism Infrastructure Development Scheme • Total Sanitation Campaign • State Water Policy, 2003.

The above identification and analysis of issues has been summarised in Table 13.

Table 13: Issues, Causes and Impacts/Risk

Issues/Problems	Causes	Impacts/Risks
1. Reduced water availability due to increasing demand (population, tourists).	• Unreliable water supply • Increase in the demand from population / tourists • Inadequate recharge of water sources due to uneven rainfall.	• Deprivation of basic necessity & quality of life • Water riots • Health risk
2. Reduced water availability due to source overexploitation, source un-sustainability & neglect of traditional water sources.	• Limited water resources • Lack of river basin level planning • Competing water usage	• Drying up of source • Catchment degradations • Waste of investment • Risk of food insecurity • Agriculture/Horticulture revenue loss
3. Reduced water availability due to infrastructure constraints, e.g., non-availability of electricity supply & increased leakage in the public distribution system	• Unauthorised tapping/metering • Old/worn out infrastructure leading to leakage	• Unaccounted resource loss leading to strain on existing sources • Loss of revenue
4. Reduced water availability due to lack of integrated water management strategies/plans, monitoring & funds for implementation.	• Hydropower projects/other water uses require water diversion • Competing water use • Non-availability of adequate funds for planning & implementation	• Change in hydrological regimes leads to variation in ecology of connected natural drainage system as well as water uses down-stream • Ecological imbalance • Catchment degradation • Water pollution
5. Deterioration of surface & groundwater quality due to contamination.	• Water pollution due to fertilizer, pesticides, sewage & dung ingress in water sources • Poor management of waste	• Increased public health risk & burden of diseases
6. Inadequate sewage infrastructure & sanitation services in the State.	• Drinking water source / transmission & distribution contamination due to inadequate sewage & solid waste treatment & disposal.	• Increased public health risk/mortality & burden of water borne diseases • Water related diseases due to unsafe drinking water on account of inadequate sanitation
7. Inadequate community participation in rural water supply & sanitation leads to poor water management	• Inadequate ownership of the resources	• Resource loss/wastage • Increased Government expenditure for management of resources • Increases drudgery of women for fetching water in remote areas in the State.

Issues/Problems	Causes	Impacts/Risks
8. Gaps in coordination of institutions managing water sector leads to water management gap in operational efficiency & financial realisation.	• Lack of implementation of reforms • Lack of pricing of resources. Continued subsidies on resources • Resource under valuation • Absence of decentralised operation & maintenance of water supply schemes	• Resource loss/wastage • Revenue loss to the sector

3.2 Sewage

Increasing Gap in Sewage Collection, Treatment and Disposal (Rural and Urban) is Leading to Water Pollution: The gap in rural and urban sewage generation and collection in the State exceeds 1,50,000 and 49,000 klds, respectively. At district level, the gap in rural sewage generation and collection ranges from 822 klpcd in Lahaul and Spiti to 31,060 klpcd in Kangra. Similarly, the gap in urban sewage generation ranges from 1264 klpcd in Bilaspur and Kullu to 27,365 klds in Solan. These gaps indicate discharge of sewage both in rural and urban areas without collection and treatment.

Increasing Public Health Risk due to Discharge and Disposal of Untreated Sewage on Land and Water Body: Both surface and groundwater quality is deteriorating due to extensive and severe pollution from domestic and agricultural sources. The point sources of untreated effluents and sewerage and diffused sources of pollutants deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the State due to unhygienic methods of handling water. At the State level, cases of hospitalisation due to diarrhoea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of hospitalisation due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul and Spiti, Mandi, Sirmaur and Una, reported increase in hospitalisation due to diarrhoea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in hospitalisation due to hepatitis during 1995 to 2002.

Increased Public Health Risks due to Open Defecation in Rural/Urban Areas and inadequate Sanitation at Tourist Units/Destinations/Circuits/Religious Places/Heritage Sites/ Trekking/ Transportation Routes: The additional sewage generation due to tourist arrivals is expected to exceed 847 mld in 2011 and 1338 mld in 2021 in the top five tourist destinations. Vulnerability analysis shows that sewage infrastructure in Shimla, Kangra and Chamba districts, Kullu, Ghumarwin and Sadar in Bilaspur District is already under stress. Additional tourist load will increase pressure on existing sewerage infrastructure.

Inadequate Integrated Water Resource, Water Supply, Sewage and Sanitation Approach/Management Strategies/Plan Leads to Higher Water Consumption and Sewage Generation: Demand side management in water sector has not been attempted so far. There is no monitoring system for monitoring the water intake and use in industrial, construction activity, sanitary applications, irrigation and other purposes without assessing the carrying capacity/ potential. The construction of a large number of reservoirs and dams; diversion of streams and rivers and hydroelectric projects leads to reduced flow into wetlands/water bodies/reservoirs. Further, release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/water body/river. The reduced down-stream ecological flow leads to ecological imbalance. Increasing water consumption/demand by the population is leading to higher sewage generation. Lack of management of demand on the up-stream side

and lack of optimised solution, e.g., recovering, recycling, reducing leads to wastage of resource and increased pollution.

Inadequate Finances to Accelerate/ Upgrade /Implement Sewage Infrastructure Leads to Water Pollution: There is a growing perception that water cannot be indefinitely provided as a service, however, there is still no clear-cut pricing option available. Differences over modalities of fixing the price of water arise because water is both treated as a basic need or service and a commodity. Government policies and regulations on water management have so far been unable to stem the growing problems related to water quality and quantity in Himachal Pradesh. Economic incentives and subsidies have not been beneficial in terms of promoting conservation of water resources. Government subsidies to the irrigation and domestic water supply sectors in the past several decades have allowed for greater expansion and development of both, but have also led to a complete under-valuing of the resource. Groundwater extraction by pumping is indirectly encouraged through subsidies for fuel and electricity. Rural and urban water charges are much lower than the cost of provision and suffer from poor operation and maintenance. The result in all sectors has been higher consumption and insufficient cost recovery for water supply and sanitation.

Gaps in Institutional Operation Mechanism Related to Sanitation Leads to Gaps in Operational Efficiency: A number of agencies are involved at State, district, *tehsil* and village levels for management of sanitation. Lack of coordination and integrated planning leads to gaps in infrastructure development and operational inefficiency.

Tardy Implementation of Reforms/Lack of Public Participation in Water Supply and Sewage Sector Leads to Reduced Coverage of Sanitation Services: Lack of private and Panchayati Raj Institution participation in water supply distribution and sewage collection and treatment is indicative of gaps in policy implementation. Besides Panchayati Raj Institutions, water and sanitation committees are an alternative institutional mechanism being suggested, though relationship between them and Panchayati Raj Institution bodies is not yet clearly articulated. Participation of Non Government Organizations might be limited on account of their technical deficiencies, while large-scale private participation is unlikely until new policies are firmly in place.

Inadequate Awareness Leads to Lack of Community/Non Government Organizations Participation in Rural Water Supply and Sanitation: Since the Government has the responsibility for providing water supply and sanitation, community initiatives are minimal in the sanitation sector. Under difficult terrain and dispersed habitations, managing a water supply can become very expensive if sufficient social development input is not provided. This is one of the main problems now facing the rural water supply and sanitation scheme in the State. *Mahila Mandal* is present in most of the villages, but they are not formed due to community initiatives. Instead, the District Rural Development Agency and other Government Departments constitute them for the delivery of their schemes. There are a few NGOs working especially on women issues or for water supply and sanitation. Rural people in Himachal Pradesh are fairly individualistic, *Khatris*, for instance, are almost always owned by the individual households and investments at community level are limited.

Water supply and sewage sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address inadequate service delivery and quality in order to reduce demand and supply gap and disease burden, but also sustain the sector. A mapping of the issues, policies and programmes framework is described in Box 3.

Box 3: Policies Mapped with the Issues in Water Supply Sector

Issues	Policies/Plans/Programmes
1. Increasing gap in sewage collection, treatment & disposal is leading to water pollution.	State Water Policy, 2003 Tourism Policy, 2005 HP Municipal Act, 1994 HP Ground Water Pollution Act, 2005 HP Town & Country planning Act, 1977 *Panchayati Raj* Act, 1994 State's Sector Reforms, 1999 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
2. Increased public health risk due to discharge & disposal of untreated sewage on land & water bodies.	State Water Policy, 2003 Tourism Policy, 2005 HP Ground Water Pollution Act, 2005 State's Sector Reforms, 1999 Health Vision, 2008 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 HP Non-Biodegradable Garbage (Control) Act, 1995 River/Stream Bed Mining Policy Guidelines, 2004 HP Municipal Act, 1997/ HP Municipal Bye-Law, 2006 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
3. Increased public health risk due to open defecation in rural/urban areas & inadequate sanitation at tourist units/ destinations/transit points & transportation routes.	State Water Policy, 2003 Tourism Policy,2005 HP Ground Water Pollution Act, 2005 State's Sector Reforms, 1999 Health Vision, 2008 HP Town & Country Planning Act, 1977 *Panchayati Raj* Act, 1994 HP Non-Biodegradable Garbage (Control) Act, 1995 River/Stream Bed Mining Policy Guidelines, 2004 HP Municipal Act, 1999/HP Municipal Bye-Law, 2006 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
4. Inadequate integrated water resources/water supply/sewage/ sanitation approach leads to higher water consumption & sewage generation.	State Water Policy, 2003 New Hydropower Policy, 2006 Tourism Policy, 2005 HP Forest Sector Policy, 2005 HP Groundwater Pollution Act, 2005 HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 State's Sector Reforms, 1999 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign

Issues	Policies/Plans/Programmes
5. Inadequate finances to accelerate/upgrade/implement water supply & sewage infrastructure results in water pollution.	State Water Policy, 2003 New Hydropower Policy, 2006 Tourism Policy, 2005 HP Forest Sector Policy, 2005 HP Groundwater Pollution Act, 2005 HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 State's sector reforms, 1999 Notification No. IPH-B (C) 10-1/2004 Notification No. IPH-B (C) 10-3/2004 Notification No. IPH-B (F) 2-2/2004 Notification No. IPH-B (F) 5-4/2004 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
6. Gap in institutional operational mechanism related to sanitation leads to gap in operational efficiency.	State Water Policy, 2003 New Hydropower Policy, 2006 Tourism Policy, 2005 HP Groundwater Pollution Act, 2005 State's Sector Reforms, 1999 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
7. Tardy implementation of reforms/lack of public participation in water supply and sewage sector leads to reduced coverage of sanitation services.	State Water Policy, 2003 New Hydropower Policy, 2006 Tourism Policy, 2005 State's Sector Reforms, 1999 *Panchayati Raj* Act,1994 HP Housing & Urban Development Authority Act, 2004 HP Tourism Development & Registration Act, 2002 NREGA/EIVS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
8. Inadequate awareness leads to lack of community participation in rural water supply & sanitation sector.	State Water Policy, 2003 New Hydropower Policy, 2006 Tourism Policy, 2005 HP Groundwater Pollution Act, 2005 State's Sector Reforms, 1999 HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 *Panchayati Raj* Act, 1994

The above identification and analysis of issues has been summarised in Table 14.

Table 14: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Increasing gap in sewage collection, treatment & disposal is leading to water pollution.	Increased sewage generation from population/tourists Inadequate infrastructure due to	Increased water pollution Increased burden of diseases/health risks

Issues	Causes	Impacts/Risks
	incomplete connectivity, incomplete coverage & absence of sewage treatment plant.	
2. Increased public health risk due to discharge & disposal of untreated sewage on land & water bodies.	Water pollution due to sewage & dung ingress in water sources Unhygienic methods of handling waste Poor management of waste	Increased burden of diseases
3. Increased public health risk due to open defecation in rural/urban areas & inadequate sanitation at tourist units/destinations/transit points & transportation routes.	Inadequate sanitation infrastructure (rural & urban) Unregulated tourist transit points Drinking water source/transmission & distribution coming in contact with sewage, Municipal & bio-medical waste	Increased burden of diseases/mortality
4. Inadequate water supply/sewage/sanitation water consumption & sewage generation.	Competing water use Inadequate demand side management Inadequate monitoring of consumption Independent institutional responsibility for consumption	Change in hydrological regimes leads to ecological imbalance Resource loss Catchment degradation/ sewage generation Water pollution
5. Inadequate finances to accelerate/upgrade/implement water supply and sewage infrastructure results in water pollution.	Inadequate pricing of resource Continued subsidy Resource under valuation Government expenditure	Water pollution due to inadequate infrastructure
6. Gap in institutional operational mechanism related to sanitation leads to gap in operational efficiency.	Inadequate implementation of reforms Lack of integrated planning & coordination	Gaps in service delivery Increased water pollution
7. Tardy implementation participation in water supply & sewage sector leads to reduced coverage of sanitation services.	Inadequate implementation of reforms Inadequate development business model	Reduced infrastructure development Gaps in service delivery Increased waste pollution
8. Inadequate awareness leads to lack of community participation in sanitation sector.	Lack of ownership of the resource Difficult terrain & desperate location Lack of gender participation Lack of NGOs participation	Unhygienic living conditions/ burden of diseases Increased Government expenditure for management of sanitation Water pollution

3.3 Health

Water Related Diseases due to Non Access to Safe Drinking Water : At the State level, cases of hospitalisation due to diarrhoea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of hospitalisation due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul and Spiti, Mandi, Sirmaur and Una reported increase in hospitalisation due to diarrhoea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in hospitalisation due to hepatitis during 1995 to 2002.

A large section of population in the State lacks access to potable water supply. Water distribution is monitored by the Municipal Corporation (MC) in Shimla and Municipal Councils (MCs) in Solan and Palampur,

whereas in Parwanoo, it is being distributed by the HIMUDA. In other areas, it is under the Irrigation and Public Health Department. However, the gap in demand and supply for rural potable water in the State exceeds 2,00,000 kilolitres per day (kld) considering a benchmark of 70 litres per capita per day (lpcd). Similarly, the gap in urban potable water supply in the State exceeds 50,000 kld considering a benchmark of 140 lpcd.

- At district level, the gap in supply and demand of urban potable water ranges from 1383 kld in districts Bilaspur and Kullu to 27,365 kld in Solan. Further, the gap in rural potable water supply ranges from 822 klpcd in Lahaul and Spiti to 31,000 klpcd in Kangra.
- These gaps indicate that population in rural areas is more affected by low access as well as shortage of potable water in the State. It also indicates that urban areas have better infrastructure to meet water supply demand in comparison to rural areas.

Health Issues due to Inadequate Sanitation: The gap in rural and urban sewage generation and collection in the State exceeds 1,50,000 kld and 49,000 kld, respectively. At district level, the gap in rural sewage generation and collection ranges from 822 kld in Lahaul and Spiti to 31,060 kld in Kangra. Similarly, the gap in urban sewage generation ranges from 1264 klpcd in Bilaspur and Kullu to 27,365 kld in Solan. These gaps indicate discharge of sewage both in rural and urban areas without collection and treatment.

Health Issues due to Inadequate Solid Waste Collection and Treatment: The gap in rural and urban Municipal Solid Waste generation, collection and treatment at State level is about 758 and 185 tonnes per day (tpd), respectively. At district level, it ranges from 4.2 tpd in Lahaul and Spiti to 157.7 tpd in Kangra in rural areas. Similarly, it ranges from 4.8 tpd in Bilaspur and Kullu to 104.5 tpd in Solan in urban areas.

- The gap in rural and urban Bio-Medical Waste generation, collection and treatment at State level exceeds three and one tpd, respectively. In rural areas, this gap ranges from 60 kg per day in Lahaul and Spiti to 709 kg per day in Kangra. Similarly, it ranges from 55 kg per day in Bilaspur and Una to 305 kg per day in Shimla.
- These gaps in Municipal Solid Waste (MSW) and Bio-Medical Waste (BMW) management indicate their untreated disposal in both rural and urban areas.
- Lack of sewage, Municipal Solid Waste (MSW) and Bio-Medical Waste (BMW) collection, treatment and disposal facilities results in vulnerability of water supply sources to both microbiological and chemical contamination. Further, the population behavior with respect to personal hygiene and sanitation gets adapted to existing situation. It is reflected in practices, like open defecation, less usage of latrines, reduced washing of hands and bathing and poor kitchen cleanliness.

Inadequate Health Infrastructure: The number of beds available per 1000 population is 1.2 in the State, which is much less than 3.96 per 1000 population in the world. National Rural Health Mission 2007-08 report highlights lack of health infrastructure in the State due to inadequate mechanism of drugs distribution, inadequate capacity of existing infrastructure including buildings and equipment, shortage of trained medical/paramedical staff at Public Health Centre (PHC) / Community Health Centre (CHC) levels and lack of participation of Non Government Organizations / Community Society Organizations and the Private Sector in health care system.

Health Deterioration due to Air Pollution: At State level, the percentage of population dependent on biomass/fuel wood for cooking in rural and urban areas exceeds 80 and 20 percent, respectively. This indicates exposure of population, especially women, to smoke/indoor air pollution.

- Increase in registered vehicles and expansion of road network in urban areas has resulted in deterioration of urban air quality. Industrial areas like Baddi, Kala

Amb and Parwanoo have been classified as severely polluted areas based on Comprehensive Environment Pollution Index (CEPI) developed by Central Pollution Control Board (CPCB). Air pollution from industries is one of the major factors in the determination of this index.

Health Deterioration due to Malnutrition: Low birth weight, mothers' malnutrition, low birth weight of newborn, delayed feeding of newborn, underfeeding of the mother, inadequate breastfeeding of the baby, delayed weaning practices, social taboos about food, religious hurdles and sentiments, worm-infestation, water-borne diseases, acute respiratory infections, non availability of nutrition in local tapioca etc. cause disease burden in Himachal Pradesh. These indicate malnutrition amongst children and pregnant women.

Occupational Health of Workers in Industries: Data from labor bureau, Government of Himachal Pradesh indicate negligible occurrence of 'occupational disease' as per Factory Act, 1948 and Employees State Insurance Act, 1948. This has been attributed to low level of reporting both by employers and employees to the respective agencies. However, the Comprehensive Environment Pollution Index (CEPI) data from CPCB and hospitalisation statistics for upper and lower respiratory diseases in the districts having major industries in Himachal Pradesh indirectly indicate occupational health issues of industrial workers.

Communicable Diseases due to Tourism: HIV positive cases are concentrated in the five districts of Shimla, Bilaspur, Hamirpur, Mandi and Kangra. Four districts, except for Hamirpur, are major tourist destinations. A number of HIV/AIDS infections have also been reported along the national highways, i.e., from Shimla to Kangra and from Anandpur Sahib to Manali.

Lack of Awareness: ' State Project Implementation Plan' under National Rural Health Mission (NRHM)', 2007-08 highlights lack of awareness about health issues due to limited reach and extent of public awareness campaigns on account of hilly terrain/topography and lack of NGO and Civil SocietyOrganization (CSO) participation in the health sector in the State.

Inadequate Health Infrastructure for the Management of Hazardous, Bio-medical and Radioactive Wastes: With advancement of medical science, most of the hospitals/nursing homes are now equipped with latest instruments for diagnosis and treatment of various diseases. One of the most important aspect associated with hospitals is the safe management of the wastes generated from these establishments, which contain human anatomical wastes, blood, body fluid, disposable syringes, used bandages, surgical gloves, blood bags, intravenous tubes etc. Besides Bio – Medical Waste, the generation, collection and disposal of mercury waste (thermometer, fluorescent lights and CFLs etc.) is not adequate and proper. This poses health risks and increased environment management costs. The main concern lies with the Bio-medical waste generated from hospitals/nursing homes, as it may pose deleterious effects due to its hazardous nature. Bio-medical wastes, if not handled in a proper way, is a potent source of diseases, like AIDS, Tuberculosis, Hepatitis and other bacterial diseases that cause serious threats to human health. The related issue with the inadequate health infrastructure is improper siting of facilities (to collect treat and dispose off bio-medical/hazardous/solid waste), which have been set up in the State. The improper siting, inadequate treatment and disposal of waste (resulting out of mixing of waste from different streams) pose grave threats to human life and the natural environment.

Inadequate Monitoring and Evaluation: The participation of Health and Family Welfare Department in health monitoring and inspection *vis a vis* environmental risks is

inadequate. The lack-a-daisical attitude of the authority, coupled with inadequate monitoring of banned chemicals and other substances, lack of rapt reporting of the incidences result in delay in providing an early warning of epidemic and disease outbreaks and infestations to the citizens.

Inadequate Research and Development (R&D) and Medical Professional Courses/Training on Emerging Health Issues: Diseases like cancer, heart disease, hypertension, diabetes etc and various microbial threats like viral flue, cholera, plague have not been given adequate attention in the State. The current standards/accreditation of medical professional courses/training including para-medical training need to be upgraded and matched with the best in the industry and duly accredited.

Health sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address inadequate service delivery in order to reduce the disease burden in the State. A mapping of the issues and policies and programmes framework is described in Box 4.

Box 4: Policies Mapped with Issues in Health Sector

Issues	Policies/Plans/Programmes
1. Water related diseases due to inaccessibility to safe drinking water.	National Rural Health Mission (2005-12) *Parivar Kalyan Salahkar Samiti* (PARIKAS). Rural and Urban Water Supply Plans under Eleventh Five Year Plan (2007-2010) Rajiv Gandhi National Drinking Water Mission National Rural Employment Guarantee Scheme/Programmes Mahila *Gram Panchayat Swasthya Sahayika* scheme
2. Health issues due to inadequate sanitation.	National Health Policies/Programmes National Rural Health Mission National Urban Sanitation Policy Health Vision, 2008 *Parivar Kalyan Salahkar Samiti* (PARIKAS). Sewerage Development Plans/Schemes under Irrigation and Public Health Deptt. & Urban Development Department. Sanitation Schemes, State Sanitation Strategies, City Sanitation Task Force & Total Sanitation Campaign *Mahila Gram Panchayat Swasthya Sahayika* Scheme
3. Health issues due to inadequate solid waste collection & treatment.	National Rural Health Mission (NRHM) Integrated Low Sanitation Scheme and Total Sanitation Campaign Bio-medical Waste Disposal Plans Municipal Solid Wastes (Management and Handling) Rules, 2000
4. Inadequate health infrastructure.	Health Vision 2008 National Rural Health Mission (NRHM)
5. Deterioration due to air pollution.	Solar Thermal Programmes, Solar Cooker.
6. Health deterioration due to malnutrition.	Reproductive and Child Health and Maternal Health Programmes under NRHM Special Nutrition Programme for Adolescent Girls *Mahila Gram Panchayat Swasthya Sahayika* Scheme
7. Communicable diseases due to tourism.	HIV Testing and Counseling Facilities under NRHM (VCTCs)

Issues	Policies/Plans/Programmes
8. Operational health of workers in industries.	State Employment Insurance Scheme as defined in ESI Act, 1948.
9. Lack of awareness.	Health Vision 2008 National Rural Health Mission (NRHM) Information, Education & Communication Component of Major Health/Water Supply/Sanitation Plans/Programmes & Schemes.
10. Inadequate health infrastructure for management of Hazardous Waste, Bio Medical Waste, Radioactive Waste.	Bio-Medical Waste (Management and Handling) Rules, 1998/2003 Guidelines on Mercury-Contaminated Wastes, CPCB Hazardous Material Rules Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008
11 Inadequate Monitoring and Evaluation:	
12 Need based Research & Development (R&D) & medical professional courses & training on emerging health issues.	Health Vision 2008 National Rural Health Mission (NRHM) National Rural Health Mission (2005-12)

Pressure on account of increasing gaps and slow implementation of policies, programmes, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarised in Table 15.

Table 15: Issues, Causes and Impacts/Risk

Issues / Problems	Causes	Impacts/Risks
1. Water related diseases due to inaccessibility to safe drinking water	Untreated water supply source. Micro-biological contamination from human/animal excreta, etc. Chemical contamination from agriculture/pesticides Lack of dependable source Lack of storage infrastructure	Health risks/Epidemics/Diarrhoea/ water related diseases Health risks/unhygienic living conditions
2. Health issues due to inadequate sanitation	Lack of infrastructure: Lack of latrines Lack of sewage collection, treatment & disposal Lack of personal hygiene awareness & wash in present context	Health risks/unhygienic living conditions/water borne diseases
3. Health issues due to inadequate solid waste collection & treatment	Inadequate infrastructure for Municipal Solid Waste collection, treatment & disposal Inadequate infrastructure for Bio-Medical Waste collection, treatment & disposal	Health risks/unhygienic living conditions/water borne diseases
4. Personal hygiene & sanitation	Open defecation Lack of latrine use Lack of attention to washing of hands Lack of attention to kitchen cleanliness Lack of attention to bathing/personal hygiene	Health risks/unhygienic living conditions/water borne diseases
5. Health deterioration due to air pollution	Exposure to smoke due to burning of wood as domestic fuel Air pollution due to increased vehicular traffic Air pollution due to emissions	Health risks/increase in respiratory diseases

Issues / Problems	Causes	Impacts/Risks
	from industries	
6. Lack of awareness about health issue practices	Limited reach & extent of public awareness campaign due to topography/hilly terrain Lack of Non Government Organizations / Civil Society Organizations (NGOs/CSOs) participation	Health risks/Increased disease burden/mortality
7. Inadequate health infrastructure	Inadequate mechanism for drugs availability and distribution Inadequate utilisation of heath infrastructure due to various legal constraints Inadequate capacity of health infrastructure/facilities including buildings & equipments Shortage of trained medical/paramedical staff at Primary Health Centre / Community Health Centre levels Lack of participation of NGOs/CSOs & Private Sector in health care system	Health risks/mortality
8. Health deterioration due to malnutrition	Poor nutrition to vulnerable groups, e.g., BPL families, infants & pregnant women	Health risks/morbidity & mortality
9. Occupational health of workers in industries	Inadequate ventilation, cleanliness, sanitation and safe working practices.	Health risks/increased disease burden
10. Communicable diseases due to tourism (HIV/AIDS)	Proliferation of HIV/AIDS due to unsafe practices Lack of awareness	Health risks/increased disease burden
11. Inadequate health infrastructure for management of Hazardous Waste, Bio-Medical Waste, Radioactive Waste	Improper siting Inadequate treatment and disposal Mixing of wastes from different streams	Health risks/increased disease burden
12. Inadequate Monitoring & Evaluation:	Inadequate awareness Inadequate staff Inadequate capacity and skills	Early warning of health epidemics/disease outbreak not functional
13. Need based Research & Development (R&D) & medical professional course & training on emerging health issues	Lack of specialised and super specialty health institutions in the State Lack of trained health professionals/paramedical staff Maintaining quality health education as per Medical Council of India (MCI) standards	Health risks/increased disease burden Projected growth in Health Tourism may not be realised

3.4 Road & Transport

Environmental issues associated with road and transport sector involve issues related to bio-physical and social environment as described below. These include generic as well as specific issues related to the sector.

Lack of Access due to Poor Road Connectivity: Due to lack of access to roads and difficulty in transportation of agricultural products due to difficult terrain and sparse population in interior areas, one has to bear high costs of surface transport for taking the

produce to the consuming markets. Moreover, poor communication network due to hostile terrain leads to spoilage and wastage of products.

Poor Road Conditions Leading to Delayed Access to Warehousing as well as Markets: Hundreds of apple farmers are facing trouble in Himachal Pradesh, as their produce is not able to reach markets on time due to bad road conditions, e.g., in Kotkhai subdivision of Shimla, the cultivators inform that due to poor road conditions and landslips, the apple-loaded trucks get stuck in long traffic jams. They further said that, sometimes, the trucks, instead of reaching in a day, take almost three days to reach the markets in Delhi and other cities, which damages the fruits.

Development of New Road Infrastructure Leading to Associated Environmental Problems: New road infrastructure development in hilly terrain leads to a number of environmental impacts. Some of these impacts are on account of project activities like hill cutting, filling, blasting and disposal of muck. Road development may lead to fragmentation of habitat, loss of flora and fauna, loss of habitat, triggering of landslides and soil erosion. Further, hydropower development requires movement of heavy equipment and material in interior areas for which existing road infrastructure needs upgradation, resulting in increased intensity of impacts.

Development of Road Infrastructure Leading to Unplanned/Unauthorised Urbanisation in both Rural and Urban Areas: Improved access to road infrastructure leads to unplanned development and urbanisation both in rural and urban areas. For example, urbanisation beyond the boundaries of Master Plan in urban areas as well as mushrooming of *dhabas* along major roads/ Highways in the rural areas leads to congestion, traffic jams, air and water pollution.

Lack of Parking Infrastructure in Urban Areas Leading to Congestion and Air Pollution: Due to increase in urban traffic, especially during tourist season, the existing infrastructure runs out of capacity. This leads to traffic jams, air pollution and loss of fuel e.g., traffic jams in Shimla, Kullu and Manali.

Traffic Congestion at Tourist Spots in Rural Areas leading to Problems, such as Air Pollution and Waste Generation: Due to increase in traffic at tourist locations, e.g., Rohtang Pass, especially during tourist season, traffic jams occur very frequently, which result in air and water pollution as well as solid waste disposal problems in ecologically fragile areas.

Lack of Traffic Management in Urban Areas Leading to Air and Noise Pollution: Due to lack of integration of traffic and transportation plan with the Master Plan, existing infrastructure runs out of capacity, thereby leading to air and noise pollution.

Poor Public Transportation in Urban Areas Leading to Traffic Congestion: Poor public transportation and its non integration with other modes of transport leads to traffic congestion in urban areas resulting in air and noise pollution.

Lack of Safety and Public Health Risks due to Congested Road Infrastructure: Increased number of accidents due to congested infrastructure and occurrence of disease like HIV/AIDS due to migrant labor and truckers leads to public health risks.

Lack of Funds for Road/Highway Upgradation and Infrastructure Development: Lack of funds for highway upgradation and infrastructure development leads to increased gap in demand and availability of infrastructure. Further, lack of Private Sector participation and absence of PPP model leads to greater requirement of resources.

Road infrastructure and transportation sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address inadequate service delivery in order to reduce the disease burden in the State. A mapping of the issues

and policy and programme framework is described in Box 5.

Box 5: Policies Mapped with Issues in Road Infrastructure and Transport Sector

Issues	Policies/Plans/Programmes
1. Lack of Access due to Poor Road Connectivity	National Road Transport Policy National Urban Transport Policy Policy on Development of New Township,2010 Right of Way Policy,2002 Urban Reforms National Policy on Resettlement & Rehabilitation,2007 The Control of National Highways (Land and Traffic) Act, 2002 The Carriage by Road Act,2007 Land Acquisition Act,1894 & 1985 The Central Road Funds (State Roads) Rules, 2007 Motor Vehicles Act. 1988 Environment (Protection) Act,1986 Environment Protection Rules, 1986 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws,2006 The Himachal Pradesh Town and Country Planning Act 1977 The Himachal Pradesh *Panchayati Raj* Act,1994
2. Poor Road Conditions Leading to Delayed Access to Warehousing as well as Markets	National Road Transport Policy National Urban Transport Policy Policy on Development of New Township, 2010 Right of Way Policy, 2002 Urban Reforms Motor Vehicles Act, 1988 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act,1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977 The Himachal Pradesh *Panchayati Raj* Act, 1994
3. Development of New Road Infrastructure Leading to Associated Environmental Problems	National Road Transport Policy National Urban Transport Policy Policy on Development of New Township, 2010 Right of Way Policy, 2002 National Policy on Resettlement & Rehabilitation, 2007 The Carriage by Road Act, 2007 Land Acquisition Act, 1894 & 1985 The Central Road Funds (State Roads) Rules, 2007 Environment Protection Act, 1986 Environment Protection Rules, 1986 The Forest (Conservation) Act, 1980 Wildlife Protection Act,1972 Municipal Solid Waste (Management and Handling) Rules, 2000 Biological Diversity Act, 2002 The Air (Prevention and Control of Pollution) Act,1981/1987 The Water (Prevention and Control of Pollution) Act,1974 Noise Pollution (Regulation and Control) Rules,2000 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act,1994 The Himachal Pradesh Town and Country Planning Act

Issues	Policies/Plans/Programmes
	The Himachal Pradesh *Panchayati Raj* Act, 1994
4. Development of Road Infrastructure Leading to Unplanned/Unauthorised Urbanisation in both Rural and Urban Areas	National Road Transport Policy National Urban Transport Policy Policy on Development of New Township, 2010 National Policy on Resettlement & Rehabilitation, 2007 The Control of National Highways (Land and Traffic) Act, 2002 The Carriage by Road Act, 2007 Land Acquisition Act, 1894 & 1985 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act,1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977 The Himachal Pradesh *Panchayati Raj* Act, 1994 Motor Vehicles Act, 1988 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 The Forest (Conservation) Act, 1980 Municipal Solid Waste (Management and Handling) Rules, 2000 The Water (Prevention and Control of Pollution) Act, 1974 The Air (Prevention and Control of Pollution) Act, 1981 Noise Pollution (Regulation and Control) Rules, 2000
5. Lack of Parking Infrastructure in Urban Areas Leading to Congestion and Air Pollution	National Urban Transport Policy Policy on Development of New Township, 2010 Urban Reforms The Central Road Funds (State Roads) Rules, 2007 Motor Vehicles Act, 1988 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 Municipal Solid Waste (Management and Handling) Rules, 2000 The Water (Prevention and Control of Pollution) Act, 1974 The Air (Prevention and Control of Pollution) Act, 1981 Noise Pollution (Regulation and Control) Rules, 2000 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act The Himachal Pradesh *Panchayati Raj* Act, 1994
6. Traffic Congestion at Tourist Spots in Rural Areas leading to Problems, such as Air Pollution and Waste Generation	National Road Transport Policy National Urban Transport Policy Tourism Policy, 2005 Policy on Development of New Township, 2010 Urban Reforms The Control of National Highways (Land and Traffic) Act, 2002 Motor Vehicles Act, 1988 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 The Forest (Conservation) Act, 1980 Municipal Solid Waste (Management and Handling) Rules, 2000 The Water (Prevention and Control of Pollution) Act, 1974 The Air (Prevention and Control of Pollution) Act Noise Pollution (Regulation and Control) Rules, 2000 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act

Issues	Policies/Plans/Programmes
	The Himachal Pradesh *Panchayati Raj* Act, 1994
7. Lack of Traffic Management in Urban Areas Leading to Air and Noise Pollution	National Road Transport Policy National Urban Transport Policy Policy on Development of New Township, 2010 Right of Way Policy,2002 The Control of National Highways (Land and Traffic) Act, 2002 The Carriage by Road Act, 2007 Land Acquisition Act, 1894 & 1985 National Fuel Policy Motor Vehicles Act, 1988 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 The Air (Prevention and Control of Pollution) Act, 1981 The Water (Prevention and Control of Pollution) Act, 1974 Noise Pollution (Regulation and Control) Rules, 2000 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977 The Himachal Pradesh *Panchayati Raj* Act, 1994
8. Poor Public Transportation in Urban Areas Leading to Traffic Congestion	National Urban Transport Policy Policy on Development of New Township, 2010 Right of Way Policy, 2002 Urban Reforms National Policy on Resettlement & Rehabilitation, 2007 Motor Vehicles Act, 1988 Environment Protection Act, 1986 Environment Protection Rules, 1986 The Air (Prevention and Control of Pollution) Act The Water (Prevention and Control of Pollution) Act, 1974 Noise Pollution (Regulation and Control) Rules, 2000 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977
9LackofSafetyandPublic Health Risks due to Congested Road Infrastructure	National Road Transport Policy National Urban Transport Policy Right of Way Policy, 2002 National Policy on Resettlement & Rehabilitation, 2007 The Control of National Highways (Land and Traffic) Act, 2002 The Carriage by Road Act, 2007 Land Acquisition Act, 1894 & 1985 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977 The Himachal Pradesh *Panchayati Raj* Act, 1994 Motor Vehicles Act,1988 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 The Air (Prevention and Control of Pollution) Act The Water (Prevention and Control of Pollution) Act, 1974 Noise Pollution (Regulation and Control) Rules, 2000
10. Lack of Funds for	National Road Transport Policy

Issues	Policies/Plans/Programmes
Road/Highway Upgradation and Infrastructure Development	National Urban Transport Policy Policy on Development of New Township, 2010 Urban Reforms Land Acquisition Act, 1894 & 1985 The Central Road Funds (State Roads) Rules, 2007 The Himachal Pradesh Road Infrastructure Protection Act, 2002 The Himachal Pradesh Municipal Act, 1994 The Himachal Pradesh Business Bye-Laws, 2006 The Himachal Pradesh Town and Country Planning Act, 1977 The Himachal Pradesh *Panchayati Raj* Act, 1994 Environment (Protection) Act, 1986 Environment (Protection) Rules, 1986 The Forest (Conservation) Act, 1980 Wildlife Protection Act Municipal Solid Waste (Management and Handling) Rules, 2000 Biological Diversity Act, 2002 The Air (Prevention and Control of Pollution) Act, 1981 The Water (Prevention and Control of Pollution) Act, 1974 Noise Pollution (Regulation and Control) Rules, 2000

Pressure on account of increasing gaps and slow implementation of policy, programmes, plans and projects is leading to the emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarised in Table 16.

Table 16: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Lack of Access due to Poor Road Connectivity	Lack of availability of infrastructure facilities, collection facilities. Expensive transportation.	Loss/wastage of produce and increased pollution. Deterioration in quality of produce. Input resource loss, e.g., fertilisers, soil nutrients, water.
2. Poor Road Conditions Leading to Delayed Access to Warehousing as well as Markets	Lack of maintenance of road infrastructure. Poor traffic management. Input resource loss.	Loss/wastage of produce and increased pollution. Deterioration in quality of produce. Input resource loss, e.g., fertilisers, soil nutrients, water.
3. Development of New Road Infrastructure Leading to Associated Environmental Problems	Change in land use. Activity generation.	Habitat degradation Air pollution Water pollution Soil pollution Land use change
4. Development of Road Infrastructure Leading to Unplanned/Unauthorised Urbanisation in both Rural and Urban Areas	Fragmentation of habitat. Loss of flora and fauna. Unauthorised shops and encroachment adjacent to right of way both in rural and urban areas.	Soil erosion Restricted movement leads to safety hazards. Waste generation (Municipal Solid Waste (MSW) & sewage). Congestion on the road.
5. Lack of Parking Infrastructure in Urban Areas Leading to Congestion and Air Pollution	Lack of space at markets/commercial establishments, tourist places, religious places. Vehicle numbers exceeding planned development	Traffic congestion. Air pollution. Safety/public health hazards.
6. Traffic Congestion at Tourist Spots in Rural Areas leading to Problems,	Ad hoc development in the absences of planned	Air pollution.

Issues	Causes	Impacts/Risks
such as Air Pollution and Waste Generation	development.	Waste generation. Safety/public health risks.
7. Lack of Traffic Management in Urban Areas Leading to Air and Noise Pollution	Lack of traffic management during peak tourist season.	Air pollution. Noise pollution.
8. Poor Public Transportation in Urban Areas Leading to Traffic Congestion	Lack of alternate transportation system and inefficient operation of existing system, e.g., ropeways, combination of existing public bus transportation with other modes.	Air pollution. Noise pollution. Safety/public health risks.
9. Lack of Safety and Public Health Risks due to Congested Road Infrastructure	Migration of labour for new construction and upgradation of road infrastructure. Difficult operation of health infrastructure. Difficult access to health infrastructure.	Safety/public health risks.
10. Lack of Funds for Road/Highway Upgradation and Infrastructure Development	Lack of private participation in road infrastructure development. Lack of funds results in decreased environmental management.	Non implementation / mainstreaming of environmental and safety safeguards.

3.5 Mining & Geology

Environmental and social issues related to the mining and geology sector are improper siting of mining areas, impact on air quality, impact on water quality and quantity, noise pollution, inadequate hazardous waste treatment and disposal, land degradation, impact on flora and fauna and impact on aesthetics.

Improper Siting of Mining Areas: Mining deposits are site specific and have to be developed and mined/operated only where they exists. Hence, it is all the more important to select proper mining sites, which cause least damage to the environment. Some of the impacts include disturbance to environment, forest land, fertile land etc; problems due to land acquisition and rehabilitation of land and persons displaced; disturbance to vegetation growth along with bio-diversity and fauna of the area; air, water and noise pollution; land degradation and waste disposal etc.; loss of aesthetic beauty etc. The Department of Industries/mining has created land banks (both private and Government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts for attracting entrepreneurs and investors. These areas are close to the source of raw materials extracted from natural resources.

Poor Ambient Air Quality: Ambient Air quality/Air Pollution due to dust generated during various processes of mining:e.g. drilling, blasting, loading and unloading of mined material; on haulage roads transportation of material through trucks; fixed sources like crushers, screen, conveyors etc., The consequences of air pollution due to dust generated during mining operations may cause visible plumes and haze; staining and soiling of surfaces; aesthetic or chemical contamination of vegetation or water bodies; effect on personal comfort; amenity and health and occupational health hazards related to the metallurgical processes like, dusts containing metals, which are toxic like lead, mercury, zinc, cobalt etc. Air Quality Trends in Himachal Pradesh indicate higher concentration of Suspended Particulate Matter (SPM) in Paonta Sahib.

Removal of vegetation from the area designated for mining and other purposes produces dust, which when air-borne, causes an increase in the concentration of Suspended Particulate Matter in the surrounding areas. Removal, handling, transportation and storage of soils also cause

an increase in the concentration of Suspended Particulate Matter in the atmosphere. The use of diesel equipment in these activities causes an increase in the level of NOx. Drilling and blasting of overburden and mineral contribute Suspended Particulate Matter and explosive fumes into the atmosphere.

Water Quality/Water Pollution/Depletion of Water Sources: Water pollution may be caused by direct discharge of mine waste into water streams, due to erosion and wash off from mined out areas and waste dumps. The water drained may be charged with suspended solid particulates, dissolved chemicals and toxic substances, or may be acidic, alkaline, or polluted by acid mine drainage, not fit for the survival of fish and benthic invertebrates.

Impact of mine drainage on water regime due to degradation of surface and sub-surface water quality: Alteration of surface run off and stream flow, water pollution could cause harmful effects, such as rise in turbidity and suspended matter; rise in temperature by a few degree centigrade; aesthetic pollution due to change in colour due to toxic elements; foam and froth due to mineral beneficiation; radio-activity etc.

In the industrial area of Baddi, Barotiwala, Nalagarh, Kala Amb and Parwanoo, the water quality of the River Sirsa, Markanda and Sukhna *nallah* is categorised as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorised as A to D because industrial and domestic effluents pollute the river in Baddi, Barotiwala and Nalagarh region.

Noise Pollution Due to Mining Activities: The noise generated due to mining and allied equipments arises from: Working of machinery like loaders, dozers, locomotives etc.; Fixed plant installations like crushers, conveyors, pumps, ventilation fans; Mobile plants like compressed air rock drills, large portable compressors, diesel, trucks, front end loaders, etc.; and due to blasting activities. Exposure to noise beyond certain level is harmful to human health and efficiency. Noise pollution has become a part of industrial and urban life. Urban people are at constant exposure to such pollution contributed by movement of vehicles and blowing of horns. The State Pollution Control Board monitors noise in Shimla, Solan, Baddi-Barotiwala, Nalagarh and Una/Mehatpur areas. Solan and Baddi-Barotiwala recorded high noise pollution than Shimla. Noise and vibrations due to blasting and operation of the machines drive away wild animals and birds from the nearby forest.

Waste Management: Waste is generated due to removal of overburden and inter burden; refuse from ore processing plants including slimes, mud and tailings; waste from lubricants; oil and grease from mining machinery and disposal of sub-grade minerals. External dumps are permanent sources of land pollution as they get washed off with rains and cause air borne dust through wind action. They look ugly and repulsive. In hilly areas, the waste flowing through natural surface destroys vegetation; chokes natural drainage and the run off during rainy season; and spoils the surrounding landscape in terms of stability and natural land form.

Change in Land Use: Mining is a temporary land use and is not an everlasting process. The land use pattern undergoes a change due to the use of land for mining, excavation, dumping and other associated activities. Where communities exist at a potential mine site, mining impacts on the lost environment can significantly influence community attitude to the operation. Mining leads to changes in topography and local drainage patterns etc. Topography and land use change due to digging of open pits and dumping of over burden rock mass in the form of heaps. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from the pits affects the characteristics of the topsoil, thereby affecting the end use. The damage pattern on the surface undergoes a change due to alterations in the surface topography due to mining and associated activities.

Loss of Flora and Fauna: The mining operation causes change in the density of flora

and fauna and also affects the plantation in the core as well as buffer zones. Impact on flora and fauna due to noise pollution, land degradation and deforestation also result due to change in the landuse. It leads to loss of natural vegetation cover and permanent migiation of fauna from the area. Removal of all vegetation (flora) and fauna from the area is required for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope affect the aquatic ecology of water bodies and causes habitat degradation. Dust in the atmosphere is contributed by mining and associated activities. Dust when deposited on the leaves of the plants in the surrounding areas retard their growth.

Poor Aesthetics/Visual Impacts: Mining activities remove vegetation cover, modify the land forms, create colour contrasts and impose man-made objects into natural vistas. The removal of vegetation from the mining area and the flow of debris on the slopes gives an ugly look.

Mining sector and cross sector policies and regulatory frameworks at State level show the intent of the State Government to address the issues relating to improper siting, poor ambient air quality, deteriorating water quality and quantity, noise pollution, waste treatment and disposal, land degradation, loss of flora and fauna, and poor aesthetics. A mapping of the issues, policies and programmes framework is described in Box 6.

Issues	Policy/Plan/Programme
1. Siting of mining areas	Environment (Siting for Industrial Projects) Rules Environment (Protection) Act, 1986 EIA Notification, 2006 and Amendments Zoning Atlas Critically Polluted Areas identified by CPCB Comprehensive Environment Pollution Index (CEPI) developed by CPCB and MoEF
2. Ambient air quality/air pollution due to dust generated during various mining processes.	Environment (Protection) Act, 1986 The Air (Prevention and Control of Pollution) Act, 1981 NAAQS
3. Water quality/water pollution/depletion of water sources	National Water Policy State Water Policy, 2003 The Water (Prevention and Control of Pollution) Act HP Ground Water (Regulation and Control of Development and Management Rules The Water (Prevention and Control of Pollution) Cess Act
4. Noise pollution	Environment Protection Act, 1986 The Noise Pollution (Regulation and Control) Rules National Ambient Noise Standards
5. Waste management	Environment (Protection) Act, 1986 Water (Prevention & Control of Pollution) Act,1974 Hazardous Wastes (Management and Handling) Rules
6. Change in land use	Land Acquisition Act, 1894 & 1985

Issues	Policy/Plan/Programme
7. Loss of flora and fauna	Forest Conservation Act Forest Conservation Act, 1980
8. Poor aesthetics/visual impacts	Environment Protection Act, 1986 Mining Policy Industrial Policy Forest Sector Policy

The above identification and analysis of issues have been summarised in Table 17.

Table 17: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Siting of mining areas	Mining deposits are site specific & have to be developed & mined/operated only where they exist. Hence, it is all the more important to select proper mining sites, which cause least damage to environment	Disturbance to environment, forest land, fertile land etc. Problems due to land acquisition & rehabilitation of land & persons displaced. Disturbance to vegetation growth along with bio-diversity & fauna of the area. Air, water and noise pollution. Land degradation & waste disposal Loss of aesthetic beauty etc.
2. Ambient air quality/air pollution due to dust generated during various mining processes.	Dust generated due to various mining activities causing air pollution: Drilling, blasting, loading & unloading of mined material. On haulage roads, transportation of material through trucks. Fixed sources, like crushers, screen, conveyors etc. Air borne dust due to wind.	The consequences of air pollution due to dust generated during mining operations may impact: Visible plumes and haze. Staining and soiling of surfaces. Aesthetic or chemical contamination of vegetation or water bodies. Effect on personal comfort, amenity and health. Occupational health hazards, like: 'Silicosis', a serious life threatening lung disease caused due to mining and quarrying of silicate minerals. 'Mesothelioma; a type of cancer caused due to exposure to asbestos mining – also termed as – 'asbestosis'. Dusts containing metals, which are toxic like lead, mercury, zinc, cobalt
3. Water quality/water pollution/depletion of water sources.	Water pollution may be caused by direct discharge of mine waste into water streams. Due to erosion and wash off from mined out areas and waste dumps. The water drained may be charged with suspended solid particulates dissolved chemicals and toxic substances, or may be acidic, alkaline, or polluted by acid mine	Impact of mine drainage on water regime due to degradation of surface and sub-surface water quality. Alteration of surface run off and stream flow. Water pollution could cause following harmful effects. Rise in turbidity and suspended

Issues	Causes	Impacts/Risks
	drainage not fit for the survival of fish and benthic invertebrates.	matter. Rise in temperature by a few degree Aesthetic pollution due to change in colour due to toxic elements. Foam and froth due to mineral beneficiation. Radio-activity. Lowering of water table and depletion of water resources.
4. Noise pollution	The noise generated due to mining and allied equipments arises from: Working of machinery like loaders, dozers, locomotives etc. Fixed plant installations, like crushers, conveyors, pumps, ventilation fans. Mobile plants like compressed air rock drills, large portable compressors, diesel, trucks, front end loaders etc. Due to blasting activities.	An exposure to noise beyond certain level is harmful to human health and efficiency. The generation of unreasonable noise within the environment affects people adversely Interference with sleep Effect on hearing Effect on communication Effect on mental and physical health. Effect on working efficiency Continuous exposure of workers to high level of noise may result into: -Annoyance -Fatigue -Hypertension -Loss of hearing -Temporary shift in threshold limit of hearing. Other anatomical disturbance, like change in breathing amplitude, gastric secretion etc.
5. Waste management	Removal of overburden and inter-burden. Refuse from ore processing plants including slimes, mud and tailings. Waste from lubricants, oil and grease from mining machinery. Disposal of sub-grade mineral.	External dumps are permanent sources of land pollution as they get washed off with rains and cause air borne dust through wind action. They look ugly and repulsive. In hilly areas, the waste flowing through natural surface destroys vegetation, chokes natural drainage and the run off during rainy season. Spoils the surrounding landscape in terms of stability and natural land
6. Change in land use.	Mining is a temporary land use and is not an everlasting process. The land use pattern undergoes a change due to the use of land for mining, excavation, dumping & other associated activities.	Where communities exist at a potential mine site, mining impacts on the lost environment can significantly influence community attitude to the operation. Change in topography. Change in local drainage patterns
7. Loss of flora and fauna	The mining operations cause change in the density of flora and also affect the plantation in the core as well as	Loss of natural vegetation cover. Fleeing away of fauna

Issues	Causes	Impacts/Risks
	buffer zones. Impact on fauna due to noise, vibrations, land degradation and deforestation also results due to change in the land use.	
8. Poor aesthetics/visual impacts	Mining activities remove vegetation cover, modify the land forms, create colour contrasts and impose man-made objects into natural vistas.	Looks like an eye sore

3.6 Industry

Environmental and social issues related to the Industry Sector are improper siting of industries, impact on air quality, impact on water quality and quantity, noise pollution, inadequate hazardous waste treatment and disposal, land degradation, and impact on flora and fauna, and aesthetics.

Improper Siting of Industries: Industrial Areas in Himachal Pradesh located on the border areas adjoining Punjab, Haryana, Chandigarh, Uttarakhand and Jammu and Kashmir have attracted a large number of projects. This is especially so in case of Industrial Areas of Baddi, Barotiwala, and Parwanoo in Solan district; Mehatpur, Tahliwala and Amb in Una district; Paonta Sahib and Kala Amb Industrial Areas in Sirmaur district; Sansarpur Terrace in Kangra district; and Golthai in Bilaspur district. Over 90 percent of the investments in the Medium and Large Scale sector are in the pipeline and projects coming up in Himachal Pradesh are being implemented in these locations. Baddi, Barotiwala and Nalagarh area in Solan district have come up as a destination, especially for Textile, Pharmaceutical, and Packaging industries. HP State Pollution Control Board has prepared a Zoning Atlas for siting of Industries for all districts of the State, such as Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan district and Paonta Sahib in Sirmaur district; Sustainable Tourism Development of Dharamshala, McLeodganj and Bhagsunag areas of district Kangra; and State Environmental Atlas of Himachal Pradesh. The State Industrial Policy 2004 states that preference will be given to develop activity specific Industrial Areas, like Food Parks, Electronic City, Export Processing Zones, Export Promotion Parks, Bio-Technology Parks, Information Technology Parks, Textile Clusters, Pharma Clusters Housing, Labour Colony, Business Centres, Multiplexes etc. throughout the State, especially in the areas away from the border areas of the State. In order to achieve this, the procedure for approval of the State Government under Section 118 of the Himachal Pradesh Land Reforms and Tenancy Act will be simplified and the approval process will be expedited. Top priority will also be given to link such existing Industrial Areas and new clusters with 'A' class quality road to provide efficient inter-State and intra-State connectivity.

Further, the Department of Industries has created land banks (both private and Government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts for attracting entrepreneurs and investors to set up industries. The siting of Industries is being done as per available land bank and not as per the Zoning Atlas for Industries. Moreover, Environment Impact Assessments has an inbuilt mechanism for site selection and has scope for assessing alternate sites as well, though the EIA tool has not been adequately used.

Poor Ambient Air Quality: Air Quality Trends in Himachal Pradesh indicate that higher concentration of Suspended Particulate Matter in Paonta Sahib industrial area is caused by industrial, construction activities and vehicle movement. Ambient air quality at Baddi and Kala Amb (Industrial Areas) is very well within the prescribed standards with regard to concentration of gaseous pollutants. However, the concentration of SPM (pollutants), earlier showing increasing trend, has shown marginal

improvement during the preceding months, which is mainly due to increased infrastructure construction activities in the area.

Removal of vegetation from the area designated for mining and other purposes produces dust, which, when air-borne, causes an increase in the concentration of Suspended Particulate Matter (SPM) in the surrounding areas. Removal, handling, transportation and storage of soils also cause an increase in the concentration of SPM in the atmosphere. The use of diesel equipments in these activities causes an increase in the level of NOx. Drilling and blasting of overburden and mineral result in SPM concentration and explosive fumes in the atmosphere.

Deteriorating Water Quality and Quantity: With increasing population, urbanisation and industrialisation, it is becoming difficult to provide adequate amount of water to the users. At the same time, the problem of water quality has cropped up and has become more important in recent years than the quantity of water. It is almost impossible to find pure water in nature as water, being a universal solvent, readily dissolves and collects all kinds of impurities, but the crux of the problem lies in the contamination that is taking place due to human activities. The pollution by human activities emanating either from use of water for domestic or industrial purposes or as a result of ever increasing rate at which organic or inorganic chemicals, pesticides, heavy metals are being used and released into the atmosphere or over land, whereby they are able to enter the water cycle, have degraded our water resources to a large extent. Industrialisation coupled with discharge of untreated sewage are responsible for deterioration in water quality.

In the industrial area of Baddi, Barotiwala, Nalagarh, Kala Amb and Parwanoo, the water quality of Sirsa and Markanda rivers and Sukhna *nallah* is categorised as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorised as A to D because industrial and domestic effluents pollute the river in Baddi, Barotiwala and Nalagarh regions. Sukhna *nallah* is categorised as 'D' because Industrial and domestic effluents pollute it in Downstream Parwanoo town.

Noise Pollution: Noise pollution has become a part of industrial and urban life. Urban population is at constant exposure to such pollution caused by movement of vehicles and blowing of horns. The State Pollution Control Board monitors noise in Shimla, Solan, Baddi-Barotiwala, Nalagarh and Una/Mehatpur areas. Solan and Baddi-Barotiwala have recorded higher noise pollution than Shimla. Noise and vibrations due to blasting and machine operations drive away wild animals and birds from the nearby forest. The equipment used in the mines for various purposes including transportation of the overburden and mineral generate continuous noise. Blasting produces impulse noise, which is harmful for the human ears.

Inadequate Hazardous Waste Treatment, Storage and Disposal Facility: Hazardous waste in Himachal Pradesh comprises sludge from Effluent Treatment Plants, Waste Oils, Contaminated Containers, Others (Residual wastes) and Process Residue. There are 1862 industrial units responsible for the generation of hazardous wastes (as on 31-3-2011). Management/mode of disposal of sludge from Effluent Treatment Plant amounts to 2357.2 T/year and other residual wastes are secured through onsite storage, while used oil amounting to 3622.5 tonnes/year and process residue amounting to 1118.4 tonnes/year are recycled. Contaminated containers numbering 67604/year are also recycled/reused after cleaning and 18860 tonnes of other waste are also treated per year. Hazardous Wastes generated by Industries are usually a by-product of industrial operations, which involve heavy metals, such as arsenic, cadmium, chromium, lead, mercury etc; processes which utilise different categories of oil and petrochemicals; products, such as Poly Vinyl Chloride and plastics; waste products from photocopiers; chemicals, such as Polychlorobiphenyls; and finally, by-products, such as dioxins and furans, which are now recognised as extremely toxic substances,

affecting all forms of life. As per the report of the High Powered Committee (HPC) on Hazardous Wastes set up by the Government of India, Himachal Pradesh generates 2159 Tonnes per Annum (TPA) of Hazardous Waste against a national total of 4415954 TPA. Wastes Generated from Pulp and Paper Industry and Calcium Carbide Industry of Paonta and Kala Amb area are being recycled.

Land Degradation: Topography and land use change due to digging of open pits and dumping of overburden rock mass in the form of heaps. The land use pattern undergoes change due to the use of land for mining, dumping and other associated activities. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from pits affects the characteristics of the topsoil, thereby affecting the end use. The damage pattern on the surface also changes due to alterations in the surface topography because of mining and associated activities.

Loss of Flora and Fauna: Removal of all vegetation (flora) and fauna from the area is required for mining and other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies and causes habitat degradation. Dust in the atmosphere is caused by mining and associated activities. Dust when deposited on the leaves of plants in the surrounding areas retard their growth.

Poor Aesthetics: The removal of vegetation by way of clearing the area for setting up of industries and the flow of debris on the slopes give an ugly look to the whole region.

Inadequate Infrastructure and Civic Amenities in the Industrial Areas: The Critical infrastructure and emergency resources, for instance, fire, police, medical, civil defence etc. are also not adequately provided in the Industrial areas. The State Industrial Policy, 2004 aims to encourage the development of State of Art Industrial Areas through its agencies, like the Industries Department, Himachal Pradesh State Industries Development Corporation, Himachal Pradesh Housing and Urban Development Agency. It also encourages the establishment of Area Specific Development Agencies in potential locations themselves or through Public-Private-Partnership (PPP) model as also through exclusive participation of private investors. These Industrial Areas will be self contained and equipped with modern basic amenities; well planned, taking into account future expansion needs; will have high quality infrastructure, like roads, power, water, telecom, sanitation, effluent management and disposal, housing and other social amenities etc. Such projects will be given top priority and time bound clearances will be ensured for them. The Industry Policy 2004 also states that the State Government is fully conscious of the need to catalyse the urban rejuvenation process, especially in areas of industrial concentration. This would require strengthening of Urban Local Bodies and accessing various Central Government schemes for urban sector reforms including setting up of waste management systems with active involvement of the Private Sector. Special focus would be laid on creation of Area Specific Statutory Development Agencies, which would be entrusted with the task of managing urban growth in areas of their jurisdiction and for ensuring creation and strengthening of planned growth of social, housing, health, commercial and other related infrastructure. Nodal cities will be identified and peripheral towns will be developed within a specified radius by these statutory agencies.

Inadequate Carrying Capacity Based Planning Process: At the time of the formation of Himachal Pradesh as a State, there was virtually no industry, except for a few industrial establishments, such as Mohan Meakins and Nahan Foundry. Initially, industrialisation in the State was aimed at developing and up-dating the existing traditional skills and arts in the cottage and small industry sectors through handlooms and handicrafts. The main objective was to use the traditional skills of the local populace and raise their standards of living. Even in the 70s,

the State had very little modern manufacturing industries. Till 1977-78, there were only about 5700 SSI units and about 10 Large and Medium units employing just a few thousand people. As on 31/03/2004, there were 30839 Small Scale Industrial Units, wherein an investment of about Rs. 746.85 *crores* was involved and employment opportunities for about 1.34 *lakhs* people were generated. However, as per the current Industrial Policy, 2004 of Himachal Pradesh, the State has not adequately examined supportive and assimilative capacity of the areas, while setting aside areas for industrial development. Prioritisation of Industries in Himachal Pradesh for developing a long term perspective has not been adequately done. This is also partly responsible for the current Ribbon Development pattern followed by the industries in the State.

Limited Technological Options to Switch to Green/Clean Technologies: Industry based socio-economic development in Himachal Pradesh has exerted pressure on raw materials, like water, minerals, forest produce etc. The capability and skills to manage the natural resources optimally are limited, which is further compounded by the lack of adequate and skilled human resources. Adoption of cleaner modes of production can help in natural resource conservation and elimination of gaseous, liquid or solid wastes, reduction by reduced consumption of raw materials, modification and upgradation of the technological processes, so that optimal utilisation of natural resources is made possible, and helps in adoption of preventive rather than corrective approaches to pollution control.

Impact of Cement industry on Tourism and Transportation Sector: Due to the high availability of quality limestone, a key raw material, the cement industry has flourished within the State. Many domestic companies and Multi National Companies (MNCs) have established their manufacturing facilities here. There are three cement plants (M/s Associated Cements Co. Ltd. Gagal, District Bilaspur, M/s Ambuja Cements, Ltd. Darlaghat, District Solan and M/s Cement Corporation of India, Rajban, District Sirmaur) in large and medium sector, which have a total capacity of over four million tonnes per annum, besides about three mini cement plants, nine hydrated lime and quick lime calcium carbonate units, and 88 limestone powder/poultry feed. Moreover, four large scale cement plants have been approved to be set up in the State based on limestone deposits at Sunder Nagar, Alsindi (District Mandi), Boroh-Shind (District Chamba), Bagga-Bhalag (District Solan) and based on the reject of the National Mineral Development Corporation (NMDC) mine at Arki, District, Solan. One cement plant based on the Gumma limestone deposit (District Shimla) is under consideration.

Most of the limestone quarrying is open cast and causes substantial degradation of the land due to overburden deposits. The domestic requirement of cement is 10 *lakhs* tonnes. The rest is exported to other States. Cement manufacturers were of the view that cement clinker should be allowed to be exported to other States, so that finished cement could be manufactured there. A formula was worked out between the State Government and the manufacturers that clinker and cement could be exported to other States in the ratio of 50:50. However, in the new industrial policy, clinker has been placed in the negative list, i.e., such incentives as excise duty and income tax exemption are not applicable to clinkers, but are applicable to cement. In the changed situation, the manufacturers will prefer to manufacture cement in Himachal Pradesh itself, while clinker export to other States might be limited. The cement industry has affected the ambient air quality and is putting stress on the local infrastructure including roads in the fragile mountainous regions. It has also impacted negatively on tourist inflow.

Inadequate Transport Management and Infrastructure for Transporting Industrial and Agri-horticultural Produce: The current infrastructural facilities for transportation of industrial produce are inadequate as this aspect has not been adequately addressed. Further, truck operators' unions prevent free play of

market forces in areas of their jurisdiction. The Industrial Policy 2004 aims to address issues related to transportation of industrial produce so as to lay the foundation of strong and consistent growth of the industrial sector. For the first time under the State Industrial Policy, setting up of post harvest management infrastructure, like setting up of cold storages, mechanised packing houses, mechanised grading houses, setting up of ropeways exclusively for the transportation of locally produced Agriculture and Horticultural produce, setting up of Servicing Centres to render farm related management services and services, such as maintenance of farm equipment and machineries, will be treated as activities eligible for a specific package of incentives and concessions under this Policy.

Issues related to migration, labour, housing and health: Indiscriminate growth of existing urban clusters has been witnessed in Himachal Pradesh, especially in the vicinity of Industrial area. Though the Industrial Policy 2004 has made provisions for employment of 70 percent *bonafide Himachalis* in Industries of the State, there has been demand and supply gap in terms of low cost housing, especially for migratory industrial labour in new areas, which are emerging as a result of setting up of industries and related commercial activities. Due emphasis has not been given to ensure creation of adequate housing facilities of various categories, including industrial labour. Other required social infrastructure, namely, schools, medical and other community facilities are also not adequate. With a view to contain indiscriminate growth of existing urban clusters and to ensure availability of adequate housing in new areas emerging due to setting up of industry and related commercial activities, The Industrial Policy 2004 emphasises on ensuring creation of adequate housing facilities of various categories, including industrial labour. Specific areas will be demarcated around such industrial clusters, where housing infrastructure could be created both in the Government and Private Sector.

Permission for purchase of land for captive housing would be given in a time bound manner to the industrial units set up in the State. Similarly, supply of power and water to such housing complexes would be made on priority. Industries would be actively encouraged to tie up with local adjoining *Panchayats* and villages for arranging captive accommodation by helping such villagers augment their accommodation, so as to cater to the specific needs of the workers, who could be housed in such units. Further, there are unresolved issues related to muster and attendance roll, minimum wages, and health insurances.

Industry sector and cross sector Policy and Regulatory Framework at State level shows the intent of the State Government to address the issues relating to improper siting of industries, poor Ambient Air Quality, deteriorating water quality and quantity, noise pollution, inadequate hazardous waste treatment and disposal, land degradation, loss of flora and fauna, and poor aesthetics. A mapping of the issues, policies and programmes framework is described in Box 7.

Box 7: Policies Mapped with the Issues in Industry Sector

Issues	Policies/Plans/Programmes
1. Improper siting of industries	Environment (Siting for Industrial Projects) Rules Environment (Protection) Act,1986 EIA Notification, 2006 & amendments Zoning Atlas Critically Polluted Areas identified by CPCB Comprehensive Environment Pollution Index (CEPI) developed by CPCB & MoEF
2.Poor Ambient Air Quality	Environment (Protection) Act, 1986 The Air (Prevention & Control of Pollution) Act

Issues	Policies/Plans/Programmes
	NAAQS
3. Deteriorating Water Quality & Quantity	National Water Policy State Water Policy, 2003 The Water (Prevention & Control of Pollution) Act HP Groundwater (Regulation & Control of Development and Management) Rules The Water (Prevention & Control of Pollution) Cess Act
4. Noise pollution	Environment (Protection) Act, 1986 The Noise Pollution (Regulation & Control) Rules National Ambient Noise Standards
5. Inadequate Hazardous Waste treatmentand disposal	Environment (Protection) Act, 1986 Water (Prevention & Control of Pollution) Act Hazardous Wastes (Management and Handling) Rules
6. Land degradation	Land Acquisition Act, 1894 & 1985 Forest Conservation Act, 1980
7. Loss of flora & fauna	Forest Conservation Act, 1980 Environment Protection Act, 1986 Mining Policy Industrial Policy
8. Poor aesthetics	Forest Sector Policy
9 Inadequate infrastructure & civic amenities in the Industrial areas	Industry Policy 2004, Himachal Pradesh
10. Inadequate carrying capacity based planning process	Industry Policy 2004, Himachal Pradesh
11. Limited technological options to switch to green/clean technologies	Industry Policy 2004, Himachal Pradesh
12. Impactof cementindustryon tourism & transportation sector	Industry Policy 2004, Himachal Pradesh
13. Inadequate transport management & infrastructure for transporting industrial & agri-horticultural produce	Industry Policy 2004, Himachal Pradesh
14 Issues related to migration, labour, housing & health	Industry Policy 2004, Himachal Pradesh Factories Act, Minimum Wages Act ESI Act The Contract Labour (Regulation and Abolition) Act, 1970

The above identification and analysis of issues has been summarised in Table 18.

Table 18: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Improper siting of industries	Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources	Over extraction of mineral resources & environment pollution

Issues	Causes	Impacts/Risks
	The siting of Industries is being done as per the available land bank & not as per the Zoning Atlas for Industries.	
2. Poor Ambient Air Quality	Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular emissions & industrial emissions	Exceedence of the National Ambient Air Quality Standards (NAAQS) Impact on human health, particularly, industrial workers
3. Deteriorating Water Quality & Quantity	Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. Ancillary development in the industrial area including urban infrastructure entailing construction activities, improper discharge of industrial effluents (treated / untreated), sewage & Municipal Solid Wastes Deeper excavation on the surface or underground digging Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances, which cause water pollution Mining activities increase suspended solids & chemical contamination in the water at the site and downstream	Further deterioration of water quality in terms of benchmarks set in Primary Water Quality Criteria & Designated Best Use of Fresh Waters (A-E) Water table decreases locally, often drastically, resulting in the drying up of wells and springs in the neighbourhood. Adverse effect on water users & the aquatic ecosystem. The impact is particularly significant if water users situated downstream of the site are abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.
4. Noise pollution	Congregation of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular	Exceeding the National Ambient Noise levels. Noise drives away wild animals and birds from the nearby forest. Impact on human health, particularly on that of the industrial workers.

Issues	Causes	Impacts/Risks
	movement, industrial operations etc. Noise and vibrations due to blasting and operation of machines and equipments used in the mines for various purposes including transportation of the overburden and mineral.	
5. Inadequate Hazardous Waste treatment and disposal	Congregation of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. Hazardous waste in Himachal Pradesh comprises Sludge from Effluent Treatment Plant, Waste Oils, Contaminated Containers, Others (Residual wastes) & Process Residue Gaps in hazardous waste generation, treatment and disposal. Inadequate number of Common Effluent Treatment Plants (CETPs), e.g., there is no CETP for Baddi & Barotiwala area	Gaps between hazardous waste generation & treatment may increase further, leading to deterioration of water quality and health hazard.
6. Land degradation	The land use pattern undergoes a change due to use of land for mining, excavation, dumping & other associated activities Digging of open pits & dumping of overburden rock mass in the form of heaps Polluted water from pits affects topsoil characteristics, thereby affecting the end use. The damage pattern on the surface undergoes change due to alterations in the surface topography because of mining & associated activities.	The land use in the surrounding areas is affected due to the impact of mining on water regime. Change in value of the land & surrounding areas.
7. Loss of flora & fauna	Removal of all vegetation (flora) & fauna from the area for mining & other purposes. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affects the aquatic ecology of water bodies.	Loss of natural vegetation cover by clear felling, smothering &

Issues	Causes	Impacts/Risks
	Dust in the atmosphere is caused by mining & associated activities. Dust, when deposited on the leaves of the plants in the surrounding areas, retards their growth	
8. Poor aesthetics	Improper siting of Industries The removal of vegetation from the mining area and the flow of debris on the slope give an ugly look.	Change in land use. Change in value of the land & surrounding areas.
9 Inadequate infrastructure & civic amenities in the Industrial areas	Improper siting of Industries/Industrial Areas Inadequate need assessment of infrastructure & civic amenities Inadequacies in perspective / Master Plan for Industrial Areas.	Pressure on existing infrastructure & civic amenities.
10 Inadequate carrying capacity based planning process	Improper siting of Industries/Industrial Areas Inadequacies in perspective/Master Plan for Industrial Areas Ribbon development Inadequate attention to promote cluster based approach for development of Industries/Industrial Areas	Pressure on existing infrastructure & civic amenities. Haphazard growth, leading to ribbon development.
11. Limited technological options to switch to green/clean technologies	Inadequate incentives for setting up/switching to green/clean technologies Inadequate understanding of green/clean technologies, which could be introduced in Himachal Pradesh	Deterioration of baseline environment conditions of land, water, air & noise. Increased capital cost & investment for setting / switching to green / clean technologies.
12. Impact of cement industry on tourism & transportation sector	Growth in Cement Industries in State as a result of Industrial Policy focus on utilisation of limestone resources Inadequate infrastructure including roads to assimilate the unplanned growth in the cement Industry	Impact on ambient air & noise quality. Deterioration of road quality & related infrastructure. Reduced inflow of tourists.
13. Inadequate transport management & infrastructure for transporting industrial & agri-horticulture produce	Inadequate assessment of planning for infrastructure needs including transportation infrastructure	Increased pressure on available infrastructure for transportation of Industrial & agri-horticulture produce. Deterioration of baseline environment conditions, especially of air, noise & water.
14 Issues related to migration, labour, housing and health	Influx of migratory work force (skilled/unskilled) in & around Industrial Areas Inadequate civic amenities in & around Industrial Areas	Social unrest in view of increased migration. Deterioration of quality of life in the existing urban/peri-urban areas & around Industrial Areas.

Issues	Causes	Impacts/Risks
	Inadequate Social Infrastructure (Housing facilities, health, educational institutions etc.)	Rise in instances of communicable diseases.

3.7 Energy

Vulnerability analysis of the districts indicates that eight districts show pressure due to hydropower development. These districts are Kinnaur, Lahaul and Spiti, Chamba, Kullu, Sirmaur, Mandi, Bilaspur and Kangra. Some of the *tehsils* indicating high pressure are Nichar, Morang, Sangla, Spiti, Lahaul, Udaipur, Renuka, Balichowk, Jogindernagar, Manali, Bilaspur, Sadar, Indora and Nurpur.

Change in natural flow/hydrology and water dynamics of the reservoir/ wetland/water body: Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydro-electric projects leadtoreducedflowintowetlands/water bodies / reservoirs. Further, release of impounded water by dam / reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/water body / river. The reduced downstream ecological flow leads to ecological imbalance in aquatic flora and fauna including fisheries.

Further, competing water uses both in the upstream and downstream of the reservoir lead to issues of water availability and water quality.

Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity/reduced power generation: Scientific literature states that the normal expectancy of dams in India is assumed to be 100 years, but reservoirs in India are estimated to be losing storage capacity at an average annual rate of about one percent due to sedimentation. Data on 116 Indian large dams were analysed to determine the severity of sedimentation. By 2020, over 20 percent of reservoirs will have lost about 50 percent of their storage capacity due to sedimentation. The Baira Sul project (3x66 MW) in Himachal Pradesh, for instance, handles nearly 10,000 tonnes of silt per day, per machine during critical monsoon days. Material loss in guide vanes alone is 10 percent by weight. Pong dam is one of the 81 major reservoirs in India, which is monitored by Central Water Commission (CWC). Central Water Commission estimates indicate that the reservoir is experiencing 0.41 percent as yearly average loss in capacity. Similarly, the Department of Civil Engineering, IIT Mumbai has reported that useful life of Govind Sagar Reservior is about three fourth of the period (142 years) estimated by Bhakra Beas Management Board (BBMB) (Journal of Spatial Hydrology, Vol 8, No. 2. Fall 2008).

Catchment area disturbance, e.g., deforestation/removal of vegetation/ grazing is leading to soil erosion and siltation of water bodies/reservoirs and destruction of aquatic fauna/flora: Continuous deforestation, both legal and illegal in the catchment area is leading to declining forest cover, soil erosion and degradation of support lands. Further, uncontrolled grazing in meadows and pasture land is leading to increased pressure on and reduced water holding capacity of forests and other lands. This is causing continuous soil erosion and siltation. Further, the destruction of habitat of fishes including molluscs (pila, snails, etc.), phytoplankton and zooplankton/grasses leads to loss of fish productivity and affects other species also. The reduced depth of reservoirs due to siltation also affects fish and other species productivity due to their habitat degradation. For example in Pong reservoir, it has been observed that due to heavy siltation, shallow areas get choked in the periphery leading to destruction of fish feeding grounds. The draw down areas of Pong reservoir are occupied by nomadic graziers and *gujjars* during

March-June. Besides stray cattle also graze in the fringe area. Most of the projects in river and tributaries have been planned under implementation cascade. Presently, individual Catchment Area Treatment (CAT) plans are being prepared for every project. Further, the flow in the finances in the present systems by Compensatory Afforestation Fund Management and Planning Authority (CAMPA) (managed by GoI) to GoHP is very slow, resulting in delays in the implementation of CAT plans.

Depletion of benthic flora and fauna in reservoir/water body due to dredging/ desilting: Dredging/desilting leads to high Total Dissolved Solids/turbidity and decreased oxygen level, thereby increasing fish mortality. Further, disturbance in benthic flora and fauna leads to decreased fish productivity.

Change in land use in the catchment and fringe areas/buffer zone, e.g., submergence and promotion of agricultural/ horticultural activities is leading to adverse impacts on reservoirs/ water bodies: Submergence of land is leading to loss of land, resulting in change in land use in the catchment. Further, shift in land use and increased agricultural production patterns in the catchment, buffer zone, e.g., submergence and promotion of agricultural/horticultural activities is leading to adverse impacts on reservoirs/water bodies.

Submergence not only causes change in land use, but also creates rehabilitation and resettlement issues. Shift in land use and agricultural production patterns in the catchment, buffer zone and fringe areas is leading to adverse impacts on wetlands/reservoirs/water bodies in Himachal Pradesh, e.g., shorelines of lakes/wetlands are farmed during the draw down phase in Pong reservoir. The water bodies become recipient of insecticides, pesticides, fertilisers and heavy metals. Depleted oxygen and higher nutrient levels may lead to eutrophication and decline in fisheries. Further, bioaccumulation may lead to potential health risks. For example, it has been reported in Pong wetland report of Forest Department that chemicals, such as CAN, Urea, 12-32-16, DAP, Sulphur Phosphate and insecticides, such as nuvan etc. pollute water of reservoirs and deteriorate flora and fauna.

Inadequate enforcement of regulated activities due to involvement of multiple agencies, e.g., operation of reservoir is managed by power utility, forest areas/wetlands come under jurisdiction of Department of Fisheries, tourism promotion under Department of Tourism etc.: Lack of coordination between multiple agencies leads to poor enforcement of regulated activities leading to water pollution and impacts on aquatic and terrestrial flora and fauna.

Inadequate flow monitoring at each reservoir leads to sub-optimal flow management: Lack of flow measurement in the river basin leads to sub-optimal flow management and variations in downstream flow through the year. An online command and control regime can assist in flood management as well as maintenance of ecological flow in the river.

Hazardous waste generation due to CFL disposal: Since CFL contains mercury, lack of used CFL collection and disposal mechanism will lead to increased generation of household hazardous waste.

Inadequate usage of non-conventional sources of energy: Lack of usage of non-conventional sources of energy, e.g., solar energy at household as well as at commercial establishments (tourist/hotels/resorts/offices) is leading to higher consumption of fossil fuel, resulting in greater emissions both in rural and urban areas.

Inadequate bio-energy utilisation in the State: Among various types of natural biomasses, *Pinus* trees are abundantly found in Himachal Pradesh up to an altitude of 5500 feet. Pine needles of these trees are a major cause of fire during summer season, when trees shed these needles. Majority of the fires

are reported from pine forests since pine needles are highly inflammable due to the presence of turpentine oil in rich quantity. The burning of this biomass causes not only environmental pollution, Green House Gas emissions, but also destroys the other flora and fauna. Very little work has been done on utilising these pine needles as reinforcing material in the polymer composites. Pine needles have a potential ability to work as reinforcement for polymer matrix. The mechanical properties of pine needles reinforced polymer matrix are higher than that of matrix polymer. High weight content of pine needles enables the *Pinus* composites to increase their strength in the most effective way, when the pine needles are modified into 'particle size'. The pine needles have the potential to be an ideal substitute fibre for synthetic fibres for synthesis of green composites. These composites can be future materials for the fabrication of eco-friendly materials. This precious wealth of nature is not utilized for better end products. This can also be attributed to inappropriate pricing of pine needles and lack of collection mechanism in the State.

Issues relating to Run of the River (RoR) Hydroelectric projects: Most of the Hydroelectric projects in Himachal Pradesh are RoR projects. The adverse impacts of RoR projects are on account of tunnelling work, which generates muck resulting in pollution of water sources, seismic impact on physical structures and change in land use.

Hydropower and Non-conventional energy sector and cross sector policy and regulatory framework at State level show the intent of the State Government to address inadequate service delivery and quality in order to reduce demand and supply gap. A mapping of the issues, policies and programmes framework is described in Box 8.

Box 8: Policies Mapped with the Issues in Energy Sector

Issues	Policies/Plans/Programmes/Projects
1. Change in natural flow/hydrology and water dynamics of the reservoir / wetland / water body.	National Water Policy/State Water Policy National Hydropower Policy/State Hydropower Policy NAPCC (Conservation) Act, 2001 Indian Forests Act/River Stream Bed Mining Policy, NWCP/NLCP
2. Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity / power generation.	National Water Policy/State Water Policy National Hydropower Policy/State Hydropower Policy HP Forest Sector Policy NAPCC (Conservation) Act, 2001 Indian Forests Act/River Stream Bed Mining Policy, NWCP/NLCP
3. Catchment area disturbance, e.g., deforestation / removal of vegetation / grazing is leading to soil erosion & siltation of water body/reservoirs & destruction of aquatic fauna / flora.	National Biosphere Reserve Programme. National Afforestation Programme Indian Forest Act, 1927 Forest (Conservation) Act, and subsequent amendments Integrated Development of Wildlife Habitat. HP Forest Sector Policy, Catchment area Treatment Plans
4. Depletion of benthic flora and fauna in reservoir/water body due to dredging/desilting.	Biological Diversity Act, 2002 Biodiversity Rules Wildlife Protection Act National Biodiversity Action Plan Water (Prevention and Control of Pollution) Act, 1974
5. Change in land use in the catchment and fringe areas / buffer zone, e.g., submergence and promotion of agriculture / horticulture activities is leading to adverse impacts on reservoirs/water bodies.	National Policy on Resettlement and Rehabilitation National Wetlands Conservation Programme Catchment area Treatment Plans Biological Diversity Act, 2002 Water (Prevention and Control of Pollution) Act, 1974 Wetlands (Conservation and Management) Rules

Issues	Policies/Plans/Programmes/Projects
	National Water Policy/State Water Policy National Hydropower Policy/State Hydropower Policy NAPCC (Conservation) Act, 2001 Indian Forests Act/River Stream Bed Mining Policy, NWCP/NLCP NREGA
6. Inadequate enforcement of regulated activities due to involvement of multiple agencies, e.g., operation of reservoir is managed by power utility, forest areas / wetlands come under jurisdiction of Department of Fisheries, tourism promotion under Department of Tourism etc.	National Forest (Conservation) Act Wildlife Protection Act HP Forest Sector Policy National Wetlands Conservation Programme State Eco-tourism Policy National Water Policy/State Water Policy National Hydropower Policy/State Hydropower Policy NAPCC (Conservation) Act, 2001 Indian Forests Act/River Stream Bed Mining Policy, NWCP/NLCP
7. Inadequate flow monitoring at each reservoir leads to sub-optimal flow management.	National Water Policy/State Water Policy National Hydropower Policy/State Hydropower Policy NAPCC (Conservation) Act, 2001 Indian Forests Act/River Stream Bed Mining Policy, NWCP/NLCP
8. Hazardous waste generation due to CFL disposal.	National Environment Policy Energy Conservation Act Hazardous Waste (Management, Handling & Trans-boundary Rules) *Atal Bijli Bachat Yojona* Environment (Protection) Act, 1986 Environment Protection Rules, 1986
9. Inadequate usage of non-conventional sources of energy.	National Hydropower Policy National Electricity Policy National Electricity Act NAPCC
10 Inadequate bio-energy utilisation in the State.	National Hydropower Policy National Electricity Policy National Electricity Act NAPCC

An analysis of the issues, causes and impacts has been carried out and summarised in Table 5.

Table 19: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/risks
1. Change in natural flow / hydrology and water dynamics of the reservoir / wetland / water body.	Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydro-electric projects lead to reduced flow into wetlands/water bodies/reservoirs. Further, release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects and other infrastructure development projects requiring water diversion also change the hydrology of the wetland/water body/river.	Changes in Hydrological regime leading to variation in ecology of small stream/*khud*, which in turn affects large streams and rivers. Ecological imbalance in aquatic flora & fauna including fisheries.
2. Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity/power generation.	Continuous soil erosion in the catchment area.	Reduced power generation Reduced life of reservoir Ecological imbalance in the catchment.
3. Catchment area disturbance e.g., deforestation/removal of vegetation/grazing is leading to	Continuous deforestation both legal & illegal in the catchment is leading to declining forest cover & productivity of forests and support	Siltation leading to reduction in the capacity of reservoir/dam/wetland.

Issues	Causes	Impacts/risks
soil erosion & siltation of water bodies / reservoirs and destruction of aquatic fauna / flora.	lands. Further, uncontrolled grazing in meadows & pasture land is leading to increased pressure on and reduced water holding capacity of forests and other lands. This is causing continuous soil erosion & siltation.	Loss of habitat / biodiversity / productivity. Disturbance to feeding, breeding and nesting of birds, including migratory birds.
4. Depletion of benthic flora & fauna in wetlands / reservoirs / water bodies due to dredging / desilting.	Depletion of benthic flora and fauna in wetlands / water bodies / reservoirs due to dredging / desilting.	Disturbance to wetland / ecology and food chain. Disruption of breeding and feeding of fish. Alteration in water flow Decrease in water retention leads to high TDS / turbidity and decreased oxygen level, thereby increasing fish mortality.
5.Changeinlanduseinthe catchment and fringe areas/buffer zone, e.g., submergence and promotion of agriculture/horticulture activities is leading to adverse impacts on reservoirs/water bodies	Submergence causes change in land use. Shift in land use and agricultural production patterns in the catchment, buffer zone and fringe areas. It has been reported in Pong wetland report of Forest Department that chemicals, such as CAN, Urea, 12-32-16, DAP, Sulphur Phosphate & insecticides, such as nuvan etc. pollute water of reservoirs and deteriorate flora and fauna.	Potential health risks across the entire food chain. Fish mortality & decline in productivity. Rehabilitation & resettlement issues Ecological imbalance due to loss of forest land
6. Inadequate enforcement of regulated activities due to involvement of multiple agencies, e.g., operation of reservoir is managed by power utility, forest areas/wetlands come under the jurisdiction of Department of Fisheries, tourism promotion under Department of Tourism etc.	Lack of coordination between agencies. Lack of implementation of integrated basin plan.	Loss of fish species. Ecological imbalance in aquatic flora & fauna including fisheries. Loss of wetland/water body/reservoir area due to institutional gaps. Deterioration of surface water quality.
7. Inadequate flow monitoring at each reservoir leads to sub-optimal flow management.	Lack of basin planning approach & basin plans.	Reduced availability of ecological flow Ecological imbalance
8. Hazardous waste generation due to CFL disposal.	Lack of collection & disposal mechanism for CFLs.	Hazardous waste generation Public health risk
9. Inadequate usage of non-conventional sources of energy.	Lack of awareness. Lack of mass replications. Technology constraints.	Impacts due to hydropower development. Higher emission of air pollutions. Solar PV programme, solar thermal exertion programme, energy conservation programme under HIMURJA. MNES subsidy for water mills, new renewable energy programmes.
10. Inadequate Bio-energy utilisation in the State	Inappropriate pricing of pine needle & lack of collection mechanism.	Non utilisation of pine needles leading to forest fires and Green House Gas emissions

District specific issues will emerge out of vulnerability assessment.

3.8 Market Infrastructure

Inadequacy of system approach in agriculture/horticulture marketing practices leads to spoilage/wastage: Trading and marketing structure is traditional consisting of a long chain of intermediaries. As many as 75 percent of the farmers sell their produce at the farm level. They cannot afford to go to distant *mandis* on account of inadequacy of facilities, expensive transportation and malpractices in the assembling markets. The long marketing channel is detrimental to the quality and safety of those perishable products. The multiple handlings add costs and increase post-harvest losses, thereby adversely affecting the income of farmers and making produce comparatively costlier to the consumers. To minimise these losses, improvements are required at various levels, viz.: harvesting, grading, transport, storage, processing, packing and marketing. Therefore, marketing criteria should be an important aspect of developing systems approach for agriculture/horticulture marketing practices. It's also important to understand that waste is a resource that can be managed as part of the integrated system approach in developing future agriculture/horticulture marketing infrastructure.

Inadequate market infrastructure and inadequacy of access to markets leads to spoilage and wastage of products: Assessment of current infrastructure and marketing conditions for agricultural produce indicate inadequacy of marketing infrastructure facilities including marketing yards; transportation facilities; collection facilities; storages, grading and packing facilities; difficulty in transportation of agricultural products due to difficult terrain and sparse population in interior areas; high cost of surface transport of produce to the consuming markets; and poor communication network due to hostile terrain leads to spoilage and wastage of products.

Inadequate market infrastructure due to shift in cropping patterns by market-driven forces and climate change: Though, soil productivity has declined, however, 18 percent area increase under vegetables and fruits has been recorded. According to a report published in 2000, the field studies in districts of Bilaspur, Hamirpur, Kangra, Sirmaur, Shimla and Solan reported that, with the provision of irrigation, there are clear cut shifts in the cropping pattern. The major shift is from cereal crops to vegetable crops. Besides, multiple cropping has been introduced in irrigated areas. The crops, which are replacing traditional crops, are generally cash crops and have become a predominant factor in small farm management to earn cash in order to meet their input requirements and family monetary needs. However, in certain situations, this trend may be detrimental to meet food demands. Challenges in practicing and maintaining traditional mixed cropping and mixed farming is due to growing trend of raising single crop (mono-cropping), which is good for commercial interests. The threats from climate change can further threaten sustainable farming of such a shift in cropping pattern. Inadequacy of adequate market infrastructure to address these changes lead to wastage/spoilage with an overall long term repercussion on farm income and employment and farm based livelihoods.

Inadequate packing and packaging mechanism leads to spoilage and wastage of products: Packing and packaging methods can greatly influence air flow rates around the commodity, thereby affecting temperature and relative humidity management of produce while in storage or in transit. It is difficult to maintain the quality and safety of horticulture crops during packaging. Packaging protects the produce from mechanical injury, and

contamination during marketing. It's important to develop effective modes of disposal and prevent contamination of the products. The use of packaging materials made of plastics need to be reviewed/assessed, alternatives developed and suitable strategies including identification and adoption of good practices need to be prepared so as to reduce/eliminate waste generation.

Inadequacy of storage and warehousing infrastructure near to production areas and in markets lead to spoilage and wastage of products: The storage of fruits and vegetables require special maintenance, which includes temperature, relative humidity etc. Without the maintenance of these factors, the protection of produce during storage is difficult. Temperature is the most important environmental factor that influences the deterioration of harvested commodities. Most perishable horticultural commodities have an optimal shelf-life at temperatures of approximately 0°C. Temperatures either above or below the optimal range for fresh produce can cause rapid deterioration due to the following disorders:

Freezing: Perishable commodities are generally high in water content, and possess large, highly vacuolated cells. The freezing point of their tissues is relatively high (ranging from -3 °C to -0.5 °C), and disruption caused by freezing generally results in immediate collapse of their tissues and a total loss of cellular integrity. Freezing occurs in cold storage systems either due to inadequate refrigerator design, or due to thermostat failure. Chilling injury is manifested in a variety of symptoms including surface and internal discoloration, pitting, water soaking, failure to ripen, uneven ripening, development of flavours and heightened susceptibility to pathogen attack.

Relative humidity (RH): Relative Humidity can influence water loss, decay development, the incidence of some physiological disorders and uniformity of fruit ripening. Condensation of moisture on the commodity (sweating) over long periods of time is probably more important in enhancing decay than is the Relative Humidity of ambient air.

Drying: Inadequacy of moisture in apple, peach, plum, apricot and almond orchards because of inadequate snow and rain during the season is not good for the crops. The sudden rise in day temperature in March further reduces the moisture content of the soil. About 81 percent of the total cultivated area in the state is rain-fed.

Although, India produces a wide variety of fruits and vegetables, in the absence of adequate post harvest and marketing infrastructure, viz. irradiation facilities, storage/cold storage and cold chain facilities, the horticulture produce suffer heavy post harvest losses. The problem is further complicated due to the fact that there are no storage facilities at the farm level and the farmers are forced to dispose off the entire produce immediately on harvesting. This creates a glut situation in the market. The margins of the wholesalers and retailers are, therefore, much higher in the country. The entire burden of the distress sale in the form of low prices falls on farmers.

Wastage and loss of products due to inadequate road infrastructure and maintenance leading to its delayed transportation to the markets and wastage/spoilage of products: Hundreds of apple farmers are facing trouble in Himachal Pradesh, as their produce is not able to reach markets on time due to bad road conditions in Kotkhai subdivision of Shimla. The cultivators inform that due to poor road conditions and landslips, the apple-loaded trucks get stuck in long traffic jams. They further said that sometimes the trucks, instead of reaching in a day, take almost three days to reach the markets in Delhi and other cities, which damages the fruits. It's important to undertake research and development to reduce/eliminate post harvesting losses to optimise the returns on cultivation of high value cash crops. There is a need to identify and adopt good practices in reducing the post harvesting wastage of produce in the context of Himachal Pradesh.

Inadequacy of sewage and Solid Waste Management infrastructure at markets leads to public health risks: Due to inadequate or inefficient infrastructure, all of the waste does not get collected and transported to the final dumpsites. If, at this stage, the management and disposal is improperly done, it can cause serious impacts on health and problems to the surrounding environment, like Excreta and other liquid and solid wastes are a serious health hazard and lead to the spread of infectious diseases; Unattended lying around waste attracts flies, rats, and other creatures that, in turn, spread diseases; The wet waste that gets decomposed releases a bad odour. This leads to unhygienic conditions and, thereby, to a rise in health problems; Plastic waste is another cause for ill health. Coloured plastics are harmful as their pigment contains heavy metals that are highly toxic. The groups at risk from the unscientific disposal of solid waste include – the population in areas where there is no proper waste disposal method, especially the pre-school children; waste workers; and workers in facilities producing toxic and infectious materials. Other high-risk groups include population living close to a waste dump and those, whose water supply has become contaminated either due to waste dumping or leakage from landfill sites. Uncollected solid waste also increases risk of injury and infection.

Inadequacy of systematic market survey and planning in agricultural and horticultural sector at state level leads to inadequate market infrastructure planning and operation: Inadequacy of systematic market survey and planning leads to non-profitable and non-sustainable agriculture/horticulture, medicinal plants and non timber forest produce marketing. Market research and planning for the hills require assessment of resource crunch of small and marginal farmers; rain fed nature of crop growing; agro-climatic or agro-ecological potentials; communication systems in the hills; and market access. The research outcomes must show feasibility from farmer's field and should be within the reach of average farmers, who constitute the majority. It has been reported that in a certain year, a good tomato crop was raised in Mandi, in and around Rewalsar, but they ultimately suffered losses. The promotion of new crops, such as kiwi, has not benefitted people, as they have not been informed about its use or market avenues and, consequently, many enthusiastic farmers end in despair when faced with queries on their use and wise marketing.

Indiscriminate use of chemicals leading to over ripening/spoilage and wastage of agriculture/horticulture produce and public health risks: Wide use of chemicals, chemical pesticides, fungicides, and herbicides or weedicides pose public health risks because of their indiscriminate use, excessive quantities and substandard quality or quantity. For pesticides, toxicity level is hardly taken care of. Substandard fungicides and pesticides are on sale because of their cheap rates and are used by farmers in large amounts. Their extensive usage is leading to greater spoilage/wastage while toxicity leads to increasing public health risks. It's important to undertake research and development in the area of developing bio-pesticides and their application. Awareness programmes promoting bio-pesticides and use of less chemicals should be based on availability of alternatives to the chemicals. These can also be part of the package of practices developed for various agri-horticultural crops.

Inadequacy of awareness and usage of Information Communication Technology (ICT) tools: Inadequacy of education and understanding of farmers has been instrumental in getting inadequate information on market infrastructure and market price and post harvest management. The small and marginal farmers reveal that traditional varieties of crops could do better under adverse conditions than high yielding varieties or crops bred for better conditions. In certain pockets in the hills, pulses were of high quality and could have generated good income to farmers under prevailing conditions, when pulse prices are soaring.

Market infrastructure sector and cross sector policy and regulatory framework at the State level shows the intent of the State Government to address inadequate service delivery in order to reduce the disease burden in the State. A mapping of the issues and policies and programmes framework is described in Box 9.

Box 9: Policies Mapped with Issues in Market Infrastructure Sector

Issues	Policies/Plans/Programmes
1. Inadequate use of system approach in agricultural / horticultural marketing practices leading to spoilage / wastage.	Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation) Act, 2005 (Act No. 20 of 2005) Himachal Pradesh Agricultural Produce Markets Act, 1969 Himachal Pradesh Agricultural & Horticultural Produce Marketing (Financial) Rules, 2006 APMC Agriculture Produce Marketing Committees Act, 1963 National Water Policy, 1987 Agricultural Produce (Grading & Marking) Act, 1937, 1986 The Indian Sale of Goods Act, 1930 Consumer Protection Act, 1986 Agriculture Policy, 2000 Market Intervention Schemes (MIS) Improving Markets and Incentives Survey of Markets under Market Intelligence Scheme
2. Inadequate market infrastructure due to shift in cropping patterns because of market-driven forces & climate change.	Agriculture Policy, 2000 Agriculture Produce Marketing Committee (APMC) Act, 2006 The Agricultural & Processed Food Products Export Development Authority Act, 1985 Agricultural Produce (Grading & Marking) Act 1937 (Act No. 1 of 1937) as Amended up to 1986. The Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation Act), 2005 Agricultural Marketing through APMC
3. Inadequate packing & packaging mechanism leading to spoilage & wastage of products.	The Packaged Commodities Order,1975 Essential Commodities Act, 1955 Environment (Protection) Act,1986 National Environment Policy, 2006 Fruit Protection Act, 1935 Air (Prevention & Control of pollution) Act, 1981 The Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation Act), 2005 Agriculture Produce Marketing Committee (APMC) Act, 2006 Improved Packaging Practice Programme
4. Inadequate storage & warehousing infrastructure near production areas & in markets leading to spoilage & wastage of products.	Area Expansion Agricultural Produce (Grading & Marking) Act, 1937, 1986 Standards of Weights and Measures Act, 1976 Environment Protection Act,1986 National Environment Policy, 2006 Horticulture Development Scheme Fruit Processing Programme Fruit Product Order (FPO) – 1955 Essential Commodities Act, 1955 Fruit Protection Act, 1935 Fruit Nurseries Registration Act, 1973 Warehouse Act

Issues	Policies/Plans/Programmes
	Post Harvest Handling & Cold Chain Management & procession The Himachal Pradesh Agricultural and Horticultural Produce Marketing (Development & Regulation) Act, 2005. National Horticultural Mission (NHM), 2005
5. Wastage, spoilage & loss of products due to inadequate road infrastructure & maintenance that results in its delayed transportation to the markets.	Transportation Subsidy Schemes *Krishi Bima Yojana*
6. Inadequate sewage & solid waste management infrastructure at markets leading to increased public health risks.	National Health Policy/Programmes promote smooth interfacing with Policies & Programmes of the environment related sectors. Health & Safety at Work, etc. Act, 1974 Environment (Protection) Act,1986 National Environment Policy, 2006 Water (Prevention & Control) Act, 1974 Integrated Pest Management Act & Regulation, 2004 Municipal Solid Waste Rules, 2000 Insecticides Act, 1968 Himachal Pradesh Agricultural Pests, diseases & Noxious Weeds Act, 1969 Air (Prevention & Control of Pollution) Act, 1981
7. Inadequate use of systematic market survey & planning in agriculture and horticulture sector at State level leading to inadequate market infrastructure planning & operation.	Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation) Act, 2005 (Act No. 20 of 2005) Himachal Pradesh Agricultural & Horticultural Produce Marketing (Financial) Rules, 2006 APMC Agriculture Produce Marketing Committees Act, 1963 National Water Policy, 1987 Agricultural Produce (Grading & Marking) Act, 1937, 1986 The Indian Sale of Goods Act, 1930 Consumer Protection Act, 1986 Agriculture Policy, 2000 Market Intervention Schemes (MIS)
8. Indiscriminate Use of chemicals leading to over ripening/spoilage & wastage of agriculture/horticulture produce, thereby increasing public health risks.	Environment (Protection) Act,1986 National Environment Policy, 2006 Water (Prevention & Control of Pollution) Act, 1974 Integrated Pest Management Act & Regulation, 2004 Municipal Solid Waste Rules, 2000 Promotion of Integrated Pest Management Establishment of Plant Health Clinics Establishment of Tissue/Leaf Analysis Laboratories Plan of Popularisation of Organic Farming & Use of Bio-fertilisers Insecticides Act, 1968 Himachal Pradesh Agricultural Pests, Diseases & Noxious Weeds Act, 1969 Fertiliser Control Order, 1985 Fruit Protection Act, 1935 Air (Prevention & Control of Pollution) Act, 1981
9. Inadequate awareness & usage of Information and Communication Technology tools.	Promotion And Strengthening of Agricultural Mechanisation through Training, Testing And Demonstration Educational Technology Programme Language Development District Institutes of Education and Training (DIETs)

Issues	Policies/Plans/Programmes
	Sarva Shiksha Abhiyan *Pradhan Mantri Gramodya Yojana* (PMGY) Technical Education Quality Improvement Project Sectoral Perspectives & Development Strategy for Education National Policy on Education, 1986 Training of Farmers through Short Term Training Camps & Training Courses Exposure Visits of Farmers within & outside the State. Organisation of Seminars & Workshops

Pressure on account of increasing gaps and slow implementation of policies, programmes, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarised in Table 20.

Table 20: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Inadequate use of system approach in agriculture/horticulture marketing practices leading to spoilage/wastage.	Inadequate market information Inadequate transportation & collection facilities. Expensive transportation.	Loss/wastage of produce & increased pollution Deterioration in quality of produce Input resource loss, e.g., fertilisers, soil nutrients, water.
2. Inadequate market infrastructure & access to markets leading to spoilage & wastage of products.	Inadequate marketing infrastructure facilities, e.g., yards/sub yards/covered yards, grading, packing & storage facilities.	Loss/wastage of produce & increased pollution Input resource loss, e.g., fertilisers, soil nutrients, water.
3. Inadequate market infrastructure due to shift in cropping patterns because of market-driven forces & climate change.	Major shift is from cereal crops to vegetable crops. Changes in provision of irrigation system. Environmental changes.	Unsustainable farming Changed requirement of market infrastructure Long term repercussions on farm income and employment and farm based livelihoods.
4. Inadequate packing & packaging mechanisms leading to spoilage & wastage of products.	Variation in air flow rates & temperature & humidity around the commodity Use of bad quality packaging accessories, such as trays, cups, wraps etc.	Damage to the quality & safety of crops Contamination of the product/increased pollution load Input resource loss, e.g., fertilisers, soil nutrients, water.
5. Inadequate storage & warehousing infrastructure near production areas & in markets leading to spoilage & wastage of products.	Inadequate warehousing/cold storage facility. Inadequate post harvest storage & processing facilities. Losses in processing & handling. Freezing injury. Chilling injury.	Inadequacy of stock for future requirements.
6. Wastage, spoilage & loss of products due to inadequate road infrastructure & maintenance that results in its delayed transportation to the markets.	Bad conditions of roads & landslips. Overloading of mixed fruits & vegetables. Unsuitable transport containers Virtual absence of refrigerated & insulated trucks. Delays in product procurement after harvesting or at collection centres.	Loss of products/fruits due to temperature mismanagement. Yield & revenue loss. Impact on quality. Input resource loss, e.g., fertilisers, soil nutrients, water.
7. Inadequate sewage & solid waste	Uncollected solid waste.	Health risks

Issues	Causes	Impacts/Risks
management infrastructure at markets leading to increased public health risks.	Leakage from landfills. No proper waste disposal method. Improper management of disposal Plastic waste. Inefficient infrastructure. Inadequate awareness about insanitary conditions.	High pollution load Wet waste decomposes & releases bad odour & leads to unhygienic conditions Unattended/unscientifically disposed waste lying around attracts disease causing bacteria.
8. Inadequate use of systematic market survey & planning in agriculture & horticulture sector at State level leading to inadequate market infrastructure planning & operation.	Inadequate integrated handling system to manage the product. Inadequate storages, grading & packing facilities High transportation costs Insufficient infrastructure, Inadequate finance, shortage of skilled labour Improper storage, drying, grading practices at farm level. Inadequate processing/storage facilities/orchard management Absence of cold storages	Product loss/wastage. Loss of revenue Impacts on frequent deliveries of harvested fruits Input resource loss
9. Indiscriminate Use of chemicals leading to over ripening/spoilage & wastage of agriculture/horticulture produce, thereby increasing public health risks.	Excessive usage of chemicals for enhancing the production rate. Usage of sub standard chemicals.	Health risks to consumers / farmers. Toxic products. Early mortality.
10. Inadequate awareness & usage of Information Communication Technology tools.	Limited reach & extent of public awareness campaigns due to topography/hilly terrain Inadequate Non Government Organisation / Civil Society Organisations participation Inadequate awareness about technologies Credit instruments & crop insurance need to be made farmer-friendly. Inadequate transfer of technology through training front line Inadequate training through on-farm trials	Product wastage/loss Low yield High raw material input cost Inadequate infrastructure development knowledge

3.9 Rural Planning

Following environmental and social issues have been identified, which need to be adequately addressed and considered in rural planning while developing policies, plans, programmes and projects.

Inadequacy and lack of mainstreaming of environment in development planning of rural areas: According to Census, the population of the State has grown from 60.77 *lakhs* in 2001 to 68, 56, 509 in 2011. A majority of the population resides in the rural areas and survives on agriculture and allied activities. About 77 percent of the total labour force lives in the rural areas. Out of the total workforce, about 58.4 percent are engaged in agriculture alone.

In Himachal Pradesh, the head count ratio for the poor has remained higher in rural areas as compared to those in the urban areas. While, over time, the head count ratio of the poor both in rural and urban areas have come down considerably, the number of poor hardly

changed during the last two decades in Himachal Pradesh. In fact, Himachal Pradesh, along with Haryana, Orissa and Mizoram, is among one of the States where the total number of poor has roughly remained unchanged during the last two decades. Agriculture being the main livelihood of the rural population of Himachal Pradesh, incidence of higher head count ratio of the poor in the rural areas of the State indicates the occupational composition of poverty in the State.

Tribal population in Himachal Pradesh lives in Scheduled Areas as well as in the other areas. Districts of Lahaul-Spiti and Kinnaur and the two subdivisions of Chamba District, viz. Pangi and Bharmour have been declared 'Scheduled Areas' under the Fifth Schedule to the Constitution. The entire population in the tribal belt is rural, but the Headquarters of Integrated Tribal Development Project, namely Reckongpeo (Kinnaur), Keylong (Lahaul), Kaza (Spiti), Killar (Pangi) and Bharmour (Bharmour) are taking the shape of townships, which have also been notified as Special Area Development Authority under the Town and Country Planning Act conferring on them quasi-urban status, without disturbing their rural character. A sizeable tribal population is also residing outside scheduled areas and they are largely concentrated in Chamba and Kangra Districts (mainly Gaddies) and also on the State border in Chamba, Kangra, Una and Solan (Gujjars).

Since employment is the basis for acquiring purchasing power, which, in turn, ensures the basic requirements of livelihood, endemic poverty and miserable levels of human development are the logical conclusions of declining employment. Incidence of poverty leads to higher dependence of rural population on natural resources. Further, developmental activities carried out to alleviate their poverty in rural areas will have implications on environment at micro level if adequate environmental safeguards are not mainstreamed at the time of planning and implementation.

Decreasing farm productivity (including agriculture, horticulture, animal husbandry, fisheries related sectors etc) with increasing population: Agriculture dominates the economy of the State, though only a little over 10 percent of the total land area is cultivated. Population pressure on cultivated land is high and land holdings of most of the cultivators are small and scattered. There are more than 84.5 percent of small and marginal farmers in the State. Most of the land holdings are self-cultivated. About 20 percent of the cultivated area is under irrigation and remaining 80 percent is rain-fed. The cultivation is carried out right from 300 to 3000 meters above sea level. Decreased farm and horticulture productivity leads to dependence on natural resources. This leads to higher pressure on natural resources in rural areas. Further, increasing population migration to urban areas leads to higher pressure on civic services and increased pollution load. This requires identification of alternate opportunities and diversification into other areas, e.g. herbs, animal husbandry, floriculture and usage of biotechnology for improving farm productivity.

Inadequate rural infrastructure planning and implementation from environmental perspective: Inadequate development of rural/farm roads, power availability, tele-communications, transport, banking, market infrastructure, warehousing of farm produce, inadequate post harvest management is limiting the potential of employment generation opportunities. With limited railway network and lack of water transport, roads are the only means of conveyance in the pre-dominantly hill State of Himachal Pradesh. This sector suffers from high unit cost of road development and maintenance due to difficult terrain and remote locations. Further, there are concerns about the need to remove micro level regional disparities/imbalances in terms of creation of infrastructural facilities in Backward Areas. Identification of certain backward, remote and inaccessible areas had been undertaken, which remained neglected due to their inaccessibility and other difficult geographical and harsh climatic conditions.

The basic criteria decided for this purpose was remoteness, inaccessibility, coupled with visual perception of the level of socio-economic development and infrastructural backwardness. However, this criteria needs to include environmental sensitivity and safeguard mainstreaming in order to ensure sustainable development. Further, existing watershed based planning with integrated approach can be strengthened to develop infrastructure and livelihoods in rural areas.

Inadequate education and health facilities: Literacy and education are important tools for economic growth and effective decision making, which ultimately result in empowerment of the population including women and Scheduled Cast / Scheduled Tribes population. Quality of life and human development attainments invariably are high in the States, which have invested in education.

Physical infrastructure for providing health and education to the rural population needs to be translated into quality service delivery in order to take care of human development aspect of the population. State Government intends to make Himachal Pradesh an 'Education Hub'. However, it faces challenges of infrastructure and quality education. In so far as quality education is concerned, the State Government needs to address teacher's absenteeism and improve teachers' training. For educational institutions, appropriate infrastructure, buildings, laboratories, equipments and furniture, etc. are needed to be provided on priority to ensure their continuity. Further, increased environmental education mainstreamed with vocational/technical/basic/higher education system will address the need for implementing any developmental activity in the State.

Himachal Pradesh has better health indicators than many other States of India. However, there are some areas where the State needs improvement in performance. The Health Department perceives infrastructure shortages in the State. There are more than 1000 Primary Health Centres and Sub-Centres, which are functioning in rented buildings or in spaces provided by the *Panchayats*/Trusts. Besides, there are many hospital buildings under construction, which are in the process of completion. Improved rural health infrastructure/services and awareness will lead to decreased burden of diseases and reduced pollution load in rural areas of Himachal Pradesh.

Therefore, provision of wage employment needs to be supplemented with access to education, basic health services, and neat and clean environment and capacity enhancement to ensure sustainability of livelihood strategies adopted for the poor.

Inadequate institutional finance and credit flows (including micro finance) in environmentally sustainable economic activities: There are two main delivery channels for microfinance services. The first one is SHG (Self Help Group) and Bank Linkage Channel (SBLC), which was developed from field experiments in the early 1990s by NABARD (National Bank for Agricultural and Rural Development) through credit and other initiatives. The second channel is Micro Finance Institutions (MFIs). The first MFI in India was set up in 1974, but the momentum was achieved only during the 1990s. Initially, the formal financial institutions were reluctant to be involved with the MFIs, and social entrepreneurship was also in short supply. In recent years, banks and other institutions, helped by supportive public policies, have become more aware of commercial viability of the micro finance services.

A major gap in the services provided by the sector is that due to regulatory restrictions, savings products have not been offered until now. Financial inclusion should involve both savings and credit products. The provision of saving products will enable MFIs to offer a more complete suite of products to low income groups. There is disproportionate reliance on group lending. The MFIs in particular need to shift from group to individual-based lending. This will require focus on development of appraisal skills and

more modern management information systems.

The state is making affects for arranging resources for developing village and cottage industries and agro-horticultural industries. In Education and Health Sectors, funds allocation requires to be made for capital works as a measure of special drive to create infrastructural facilities, so as to make the new institutions functional.

Inadequate skills among rural population: The experience of first four decades of planning has revealed that the process of economic development and modernisation has not benefited the weaker sections to the extent it benefitted the other communities, though growth with social justice has been accepted as the main objective for the planned economic development. The fruits of progress and flow of benefits have not reached the majority of Scheduled Castes to the extent these should have been. They have suffered from the dual disabilities of severe economic exploitation and social discrimination. They have very few assets and are totally dependent upon agricultural pursuits and other low income generating occupations, like shoe making, sweeping, bamboo basket making, blacksmithy, weaving, poultry, piggery etc.

Inadequacy of skills among rural populace because of inadequate research and extension services are hampering the chances of maximising the opportunities for diversification of livelihood options and opportunities. Though most of development programmes/schemes intend to develop skills of the communities, its impact is largely measured as number of programmes/schemes beneficiaries (from all sections of the society). The current programmes/schemes don't adequately develop the skills of the beneficiaries, which could help them to sustain the benefits of the said programmes/schemes, improve their livelihoods and enable them to access basic services.

Therefore, there is a need to impart new skills to the rural population, e.g., in cleaner technologies/cleaner production, which can lead to achieve reduced pollution and improved environment.

Inadequate capacity of institutions, like *Panchayat*, Cooperatives and others for planning and implementation of rural development programmes: After the enactment of 73rd Constitutional Amendment Act and Himachal Pradesh *Panchayati Raj* Act 1994, three tiers *Panchayati Raj* System has been set up at grassroots level in the State. These are *Gram Panchayats* at the village level, *Panchayat Samitis* at block level and *Zila Parishad* at the district level. There are 3243 *Gram Panchayats*, 75 *Panchayat Samitis* and 12 *Zila Parishads* in the State. *Panchayati Raj* Institutions at various levels are being involved in the planning and execution of poverty alleviation and employment generation programmes to ensure the percolation of benefits under these programmes to the needy at the grassroots level. The development block is pivotal for the implementation of various rural development programmes and overall development of families living below the poverty line in the rural areas.

Under the provision of Article 243 ZD of the constitution of India and Section 185 of Himachal Pradesh *Panchayati Raj* Act 1994, District Planning Committees (DPC) have been constituted in each district. As per the mandate of the constitution, the planning process has to go through each tier of Panchayati Raj Institutions and these plans will be consolidated at the district level by the District Planning Committees. Preparation of plan is a technical work, as such technical assistance and funds are required to be provided for this purpose. Therefore, the *Panchayat*/district planning functionaries need capacity building to develop village and block level development plans, along with the mainstreaming of environmental safeguards for development.

Due to inadequate capacity of officials at the district and block levels, development programmes and projects are conceptualised and implemented in a limited manner. This

leads to non utilisation of allocated funds during the planned period.

Inadequate social cohesion leading to unequal participation in the rural development: Among the social groups, Scheduled Castes, Scheduled Tribes and Backward Classes accounted for 81 percent of the rural poor in 1999-2000 at the all India level, considerably more than their share in the rural population. The proportion of poor belonging to the Scheduled Castes, Scheduled Tribes and Backward Classes to the corresponding population is much higher than the head count ratio of all the poor in rural and urban areas both in Himachal Pradesh and at the all India level. This, combined with other deprivations, increases the vulnerability of the Scheduled Castes, Scheduled Tribes and Backward Classes population of the State leading to social incohesiveness. This is reflected in inadequate collective participation of all social groups in rural development activities; developing common programmes for village upliftment to minimise economic and gender disparities in the rural societies. This leads to unequal and non optimal utilisation of resources.

Himachal Pradesh has a large population, consisting of marginal and small farmers, Scheduled Castes, Scheduled Tribes and Backward Classes. The social status of women in a State like Himachal Pradesh with thousand years of cultural traditions is an outcome of enormous variety of social conditions and multiplicity of factors. Since time immemorial, women, not only in Himachal Pradesh, but all over India, have been subjects of oppression, neglect and demoralisation in the society. Himachal Pradesh is also characterised as a male dominated society. State is now focusing on the segment of the population has to be brought into focus for their upliftment with special emphasis on their skill upgradation, removal of unemployment and poverty and vertical growth to acquire productive assets for better living on a sustainable basis.

Rural Planning sector and cross sector policies and regulatory framework at State level show the intent of the State Government to address issues related to rural planning in Himachal Pradesh. A mapping of the issue, policy and programme framework is described in Box 10.

Box 10: Policies Mapped with Issues in the Rural Planning Sector

Issues	Policy/Plan/Programme
1. Inadequacy & lack of environmental mainstreaming in development planning of rural areas.	National Rural Employment Guarantee Scheme. Member of Parliament Local Area Development Scheme (MPLADS). Backward Area Sub Plan. Border Area Development Programme (BADP). Sectoral Decentralised Planning Programme in Himachal Pradesh. Sectoral Decentralised Planning–Revised Guidelines-2004.
2. Decreasing farm productivity (including agriculture, horticulture, animal husbandry, fisheries & related sectors etc.) with increasing population.	*Rashtriya Sam Vikas Yojana.*
3. Inadequate rural infrastructure planning & implementation from environmental perspective.	*Mukhya Mantri Gram Path Yojana.* The Rural Infrastructure Development Fund (RIDF). Rural Water Supply. Hand pumps Installation Programme. *Vikas Mein Jan Sahyog* (VMJS). District Plans in the Eleventh Five Year Plan Member of Parliament Local Area Development Scheme (MPLADS)
4. Inadequate education & health facilities.	National Health Policy, 2002 Central Rural Sanitation Programme (CRSP), Total Sanitation Camapaign (TSC).

Issues	Policy/Plan/Programme
	National Rural Health Mission. *Sarva Shiksha Abhiyan*, Government of Himachal Pradesh.
5. Inadequate institutional finance & credit flows (including micro finance) in environmentally sustainable economic activities.	NABARD, Commercial Banks, Co- operative Banks, Co-operative Credit Societies and Regional Rural Banks (RRB), Himachal Grameen Bank.
6. Inadequate skills among rural population.	All Programmes and Schemes implemented in Himachal Pradesh.
7. Inadequate capacity of Institutions, like *Panchayats* Cooperatives and others for planning and implementation of rural development programmes.	The Himachal Pradesh *Panchayati Raj* Act, 1994. *Panchayats* (Extension to the Scheduled Areas) Act, 1996. Himachal Pradesh *Panchayati Raj* (Extension to the Scheduled Areas) Rules, 2011. Manual on devolution of powers, functions and responsibilities released by Department of *Panchayati Raj*. GIZ Project on Micro Planning at *Panchayat* Level.
8. Inadequate social cohesion leading to unequal participation in rural development.	*Mahila Mandal Protsahan Yojana*. Special Component Plan (SCP) renamed as Scheduled Castes Sub Plan (SCSP) for the Scheduled Castes.

Table 21: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/risks
1. Inadequacy & lack of environmental mainstreaming in development planning of rural areas.	Socially acceptable & gainful employment opportunities are not adequately & equitably available. Planning strategies based on socio-economic well being without environmental mainstreaming.	Migration to urban areas, especially of youth. Increased pressure on natural resources. Increased urbanisation & growth of slum areas. Stress on basic amenities and inequitable access to basic amenities and resources and increase in pollution load. lienation & deepening of social incohesiveness.
2.Decreasing farm productivity (including agriculture, horticulture, animal husbandry, fisheries & related sectors etc.) with increasing population.	About 10 % of the total land area is cultivated. High population pressure on cultivated land. Small land holdings of most of the cultivators. About 20% of the cultivated area is under irrigation & remaining 80% is rain fed.	Deterioration of livelihoods/loss of livelihoods of 84.5% of the small and marginal farmers in the State. Increased pressure on natural resources. High pollution load. Abandoning of farming and increasing migration from rural areas.
3.Inadequate rural infrastructure planning & implementation from environmental perspective.	Remoteness & inaccessibility. Gaps in demand & supply. Increased population pressure. Lack of environmental mainstreaming.	High cost of development & maintenance of infrastructure. High transportation costs because of inadequate road network. Poor quality of the infrastructure. Increased pressure on natural resources High pollution load.
4. Inadequate education &	Inadequate & poor quality	Human Development potential may not be

Issues	Causes	Impacts/risks
health facilities.	service delivery in the education and health sphere. Inadequate physical infrastructure for fulfilling health & education needs of the rural population.	fully realised. High burden of diseases. Increased pollution load.
5. Inadequate institutional finance & credit flows (including micro finance) in environmentally sustainable economic activities.	Inadequate institutional finance. Inadequate numbers & skills of SHGs, *Mahila Mandals* other Community based Organisations.	Potential of microfinance in rural development e.g., water & sanitation, cottage industry. High burden of diseases; 'Health for All' may not be fully realised. High pollution load. Non availability of resource; wastage of resource.
6. Inadequate skills among rural population .	Inadequate rural institutions for developing skills. Inadequate opportunities to build skills of rural populace. Inadequate livelihood diversification options & opportunities.	Absence of new skills to support clean technologies.
7. Inadequate capacity of institutions, like *Panchayats*, Cooperatives & others for planning & implementation of rural development programmes.	Inadequate financial investment in developing the capacity of *Panchayats* Cooperatives etc. Inadequate technical & administrative & micro-planning skills.	Poor micro planning without environmental mainstreaming.
8. Inadequate social cohesion leading to unequal participation in rural development.	Inadequate inclusive development. Inadequate representation/inclusion of marginalised sections of the society in development programmes, schemes, projects.	Increased vulnerability of the marginalised sections of the society. Alienation of marginalised sections of the society.

3.10 Urban Planning

The Declaration (S-25/2) of the United Nations General Assembly on its 6th plenary meeting held on 9th June 2001, is on cities and human settlements in the new millennium. Its core points are that all human settlements should be economically productive, socially just, politically participatory, ecologically sustainable and culturally vibrant. The post-colonial period in Himachal Pradesh in the context of human settlements has been characterised by various factors and the prominent ones among these are:

The population of Himachal Pradesh has been steadily growing over the past few decades. Most growth continues to be in the geographically 'Most Habitable Zone'. The former colonial towns like Shimla have expanded considerably and there are newer towns that have expanded from small villages to large settlements, such as Kullu and Manali. Towns like Parwanoo, Baddi, Nalagarh, Kala Amb and Una that have an industrial base have

come up along the borders of the State and are growing rapidly. New growth has accelerated in the districts of Solan, Sirmaur and Una after the announcement of the 'Central Concessional Industrial Package', which has drawn an investment of approximately Rs. 1,200 crores in the last two years.

Factors like the growth of communications through roads, telephones and the Internet are creating major alterations in the pattern of human settlements and have increased the rural- urban interface. The steady spread of education, better medical facilities and increased non-agricultural employment have also altered both urban and rural settlement patterns. Consequently, pressures on the natural and built environment have increased.

Currently, critical urban planning issues are related to inadequate provision of basic urban services, especially for the poor, water, sewerage, sanitation, solid waste management, affordable housing, parking space, green areas and open space and public transport. This has been partly because of poor land management strategies, which is key for good urban planning and development as well as financing urban infrastructure development. Further, a vicious trend of ribbon development and urban corridors, affecting transport efficiency has emerged as fallout of the land use policies and land use changes. In the context of Himachal Pradesh being a special category State, following issues also becomes critical, namely, Private Sector investment is relatively subdued that implies greater role for public investment; infrastructure gaps lead to higher cost of goods and services, which necessitates accelerated efforts to develop infrastructure; and high proportion of forest cover and mountain eco-systems become constraints on rapid development. Forest clearances are difficult to get and the State has to pay Net Asset Value. The State also demands monetary compensation for providing 'eco services' to the nation. The State contributes like other normal category States for many Centrally Sponsored Schemes (CSS), unlike North East States, which contribute mostly 10 percent as State share to CSS.

Inadequate Water Supply

Himachal Pradesh is no exception to the critical urban water supply position in the major States of India. Water supply in the urban areas is inadequate in terms of quantity as well as quality. According to the State of Environment Report (SOER) – Himachal Pradesh, "The water supply systems in most of the towns are quite old and have outlived their utility, their sources need augmentation and the distribution systems in almost all the supply schemes need replacement and rehabilitation. Though all the towns of Himachal Pradesh have water supply facility, yet the per capita availability of water in a large number of towns is well below the desired norms. The major populated towns, i.e., Shimla, Solan, Mandi, Hamirpur, Bilaspur, and Dharamshala have a per capita water supply of less than 80 lpcd and the industrial towns of Baddi, Paonta Sahib and Nalagarh have a per capita water supply of less than 50 lpcd. Not all households have individual water connections in most of the towns and not all localities and areas are covered by the water distribution network. The supply is unreliable due to irregular supply, inadequacy, short duration as well as the poor quality of water. A large number of people use drinking water from traditional sources without ascertaining the quality of the water. Due to the unreliability of the water supply, consumers have made additional investments on installing individual tube wells, hand pumps, storage facilities (ground as well as overhead), pumping sets, booster pumps and filtration systems.

In a survey of drinking water in the six towns of Chamba, Dharamshala, Manali, Mandi, Shimla and Solan done by the Health Department in 1994, it was found that water-borne diseases were a major health problem in the urban areas of the State. Nearly one-third of the water samples, which were tested, were found contaminated with enteric bacterial pathogens as per State of Environment Report – Himachal Pradesh. The situation is no better in other towns as a large number of

cases of water-borne diseases are reported in hospitals every year.

The deficiencies of water supply multiply in summer due to the increase in demand and the drying up of several sources. Shimla's water crisis in summer is well known. The supply of water is not volumetric in all towns and it is a major factor in its wastage. Rich and poor sections pay the same rates and hence the consumption of more water by the higher income groups becomes a 'social good' for them, as they get it at a nominal cost. There is no system of cross subsidisation. The cost is not linked with consumption and the rates are not revised periodically with the hike in electricity charges, labour charges, and the cost of material. The principle of cost recovery has not been applied to the water supply and plan allocations have been inadequate to cope with the demand. The arrears of Rs. 17.13 crores are due from Urban Local Bodies on account of water bills to be paid to Department of Irrigation & Public Health.

One of the crucial aspects of water supply in Himachal Pradesh is that in most of the towns, it is maintained either by the Irrigation and Public Health (IPH) Department (49 towns) or the Cantonment Boards (six towns) or the Himachal Pradesh Housing Board (one town) and not by the ULBs. Only in Shimla, Solan (distribution of water) and Palampur (Operation & Maintenance (O&M) and distribution of water) ULBs have this function under their jurisdiction, but in a limited manner. Though the 74th Constitutional Amendment envisages the transfer of water supply to the ULBs, yet even after the passage of this amendment, water supply in Himachal Pradesh continues to be looked after by the IPH Department of the State Government. It is time to transfer this function along with funds and functionaries to the ULBs. Their active involvement in prioritising the works according to the needs of the people can help to provide potable water to the citizens in an efficient manner. The involvement of the local people in the operation and maintenance of the water supply systems can be secured through water users associations.

Current efforts for water conservation, treatment and recycling of waste water, rain water harvesting and water supply are inadequate to tide over the crisis and sustain the water supply system in the urban centres of Himachal Pradesh in the long run.

Inadequate Sewerage System

The sewerage system in the urban areas of Himachal Pradesh is grossly inadequate. Sewage treatment facilities exist only in seven towns, i.e., Shimla, Palampur, Sri Naina Devi, Chamba, Mandi, Bilaspur and Rohroo. Untreated sewage in other towns is disposed off in rivers. It is polluting the drinking water and damaging the ecology of the State. The cost of water treatment is also going up as river water, which is used for drinking purposes in several towns, is becoming polluted day by day due to the disposal of untreated sewage. The pollution levels in the major rivers of Himachal Pradesh, viz. Beas, Satluj, Ravi and Parbati are on the rise and have serious implications on the health of the people of Himachal Pradesh and the neighbouring States.

Inadequate Solid Waste Management

There are serious deficiencies in Solid Waste Management (SWM) in the urban areas and environmental decline is visible in almost all towns. The sudden influx of tourists puts tremendous pressure on the sanitary services. The Solid Waste Management services are inadequate and the accumulation of garbage can be seen in most of the towns. Diseases like diarrhoea and malaria break out frequently in many towns due to the poor sanitary conditions. The situation has been worsening despite the favourable climatic and environmental conditions in Himachal Pradesh. The Municipalities complain of the shortage of sanitation staff, but discussions with the local people in several towns reveal that the existing sanitation staff do not work or irregularly sweep the streets and collect the garbage. The cost of collection, transportation

and disposal is high due to certain outdated practices and old technologies. Unscientific disposal of waste is common and biodegradable waste is not taken care of at the household level.

One of the factors for poor Solid Waste Management in the urban areas is the gap in the physical targets and achievements in several Solid Waste Management activities i.e., construction of dustbins, toilets, purchase of vehicles and construction of waste treatment plants. This gap is likely to increase with the existing fiscal, institutional and functional deficiencies in the development of the urban infrastructure.

Though the ULBs of Shimla, Kullu, Manali, Nahan and Solan have Solid Waste Treatment Plants, the problem of poor Solid Waste Management continues due to the lack of support of the local people in providing segregated waste to the sanitary staff. These ULBs have to segregate waste at the sites of treatment plants, which is a costly and time-consuming affair. In a few towns i.e., Una, Hamirpur, Dharamshala and Kangra, works for construction of treatment plants are in progress. A large number of towns do not have treatment facilities and are creating environmental pollution. Heaps of polythene bags are seen in all major towns. The tourists leave a lot of garbage including polythene bags in the urban areas, which is affecting the ecology of the State. The Himachal Government is the first to enact legislation to manage non-biodegradable garbage. But throwing of garbage in drainage channels/nallahs and in the streets is still a common practice at many places and the ULBs have to start special campaigns to desilt the nallahs/channels time and again. Sanitation charges are collected by a few municipalities, which are grossly inadequate to maintain even Operation Maintenance of Solid Waste Management.

The need of funds for providing adequate treatment facilities and covering the uncovered areas is colossal. Solid Waste (Management and Regulation) Rules, 2000, formulated by the Ministry of Environment and Forests, Government of India, call upon the ULBs to take urgent steps to address problems relating to Solid Waste Management. No doubt, the ULBs are making efforts to improve the sanitary conditions in their areas, but still a lot remains to be done to create a people-friendly sustainable environment in the urban areas of Himachal Pradesh.

There are about 152 industrial units, which produce Hazardous Wastes. Sites have been identified for their disposal, but these are yet to be notified. This needs to be expedited and disposal facilities created on the ground. Hospital Waste Management is also important. The United Nations Population Fund (UNFPA) has supplied three incinerators to the zonal hospitals at Mandi, Dharamshala and Nahan. Another incinerator will be installed at the district hospital at Reckong Peo in the tribal areas. As a part of the Integrated Solid Waste Management Project, a common incinerator has been installed near IGMC, Shimla.

Inadequate Energy Efficient measures and practices in building design and construction

Energy management measures and practices have not been adequately encouraged in the planning of buildings. Buildings and townships that are energy efficient and use sustainable energies like solar and wind energies have not been adequately considered in design and implementation. Further, use of solar energy and other new and renewable sources of energy, water recycling techniques, rain water harvesting techniques and waste management practices have not been adequately promoted in an integrated manner in the new buildings and townships in residential and commercial areas. Further, provision of green spaces and open areas in new townships are not adequately provided in residential and commercial areas factoring in the hill conditions.

Inadequate Energy Efficient measures and practices in transport sector

The transportation system is not adequately energy efficient and has limited options of types of fuels and conformity with emission standards, e.g., Bharat Stage norms. Further, provision of parking norms, as per Equivalent Car Space norms in residential and commercial areas, have not been adequately considered factoring in the hill conditions in Buildings and Townships.

The area falling along the National Highway-22 is highly eco-fragile and most of the constructions are neither in accordance with the hill architecture nor environment friendly. The areas, which have been found to be most prone to this ribbon development and urban corridors, include the valleys of Kangra, Kullu, Paonta, Balh in Mandi and the belts falling in the Shimla-Parwanoo, Bhota-Hamirpur, Mehatpur-Una, Barotiwala-Nalagarh and Ghaggas-Barmana areas. It is a very undesirable trend as a result of which the back land is getting locked and wasted, and most importantly, the efficiency of transport is getting affected.

Inadequate equality in provision of services

There is a demand and supply gap in urban land, housing and other basic services. The demand supply gap makes basic services further inaccessible to the urban poor. These factors also threaten livelihoods and employment of urban poor and proliferation of slums and encroachments for sustenance of livelihoods. Provisioning and management of basic services in the urban planning does not adequately reduce the inequality in access to services between rich and poor. The concept of commercial viability does not hold for social services. City/town development and the basic amenities do not adequately take into account social conditions. For example, urban poor could face challenges in paying for the full cost of water in the event of reduction in Government grant/subsidy and introduction of Private Sector to provide such services in this sector. Benefits of certain subsidy schemes in the past have not accrued to the poor sections of the society in the urban areas. Urban Planning sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address urban planning issues. A mapping of the issue, policy and programme framework is described in Box 11.

Box 11: Policies Mapped with the Issues in Market Infrastructure Sector

Issues	Policies/Plans/Programmes
1. Inadequate Water Supply.	The National Water Policy, 2002. State Water Policy, 2005 National Health Policy, 2002. The Water (Prevention & Control of Pollution) Act 1974, (Amended in 1988). The Water (Prevention & Control of Pollution) Cess Act, 1977 (Amended in 1992 and 2003). Notification on Protection & Improvement of Quality of Environment in the Himalayas, 2001. The Himachal Pradesh Municipal Corporation Act, 1994, Act No. 12 of 1994. The Himachal Pradesh Municipal Act, 1994, (Act No. 13 of 1994). The Himachal Pradesh Groundwater (Regulation & Control of Development & Management) Rules, 2006. Notification No. IPH-B (F) 10-3/2004, Dated 23.3.3007, Shimla-2. Himachal Pradesh Municipal Business Bye-Laws, 2006. Jawahar Lal Nehru National Urban Renewal Mission (JNNURM) Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT) Accelerated Urban Water Supply Programme (AUWSP) Hand Pumps Installation Programme

Issues	Policies/Plans/Programmes
2. Inadequate Sewerage System.	National Health Policy, 2002. The National Water Policy, 2002. The Water (Prevention & Control of Pollution) Act, 1974 (Amended in 1988). The Water (Prevention & Control of Pollution) Cess Act, 1977 (Amended in 1992 & 2003). Environment (Protection) Rules, 1986. Notification on Protection & Improvement of Quality of Environment in the Himalayas, 2001. The Himachal Pradesh Municipal Corporation Act, 1994, Act No. 12 of 1994. The Himachal Pradesh Municipal Act, 1994, (Act No. 13 of 1994). Himachal Pradesh Municipal Business Bye-Laws, 2006. Jawahar Lal Nehru National Urban Renewal Mission (JNNURM).
3. Inadequate Solid Waste Management.	National Health Policy, 2002. The National Water Policy, 2002. The Water (Prevention & Control of Pollution) Act. 1974 (Amended in 1988). The Water (Prevention & Control of Pollution) Cess Act, 1977 (Amended in 1992 & 2003). Environment (Protection) Rules, 1986. Municipal Solid Wastes (Management & Handling) Rules, 2000. Notification on Protection & Improvement of Quality of Environment in the Himalayas, 2001. The Himachal Pradesh Municipal Corporation Act, 1994, Act No. 12 of 1994. The Himachal Pradesh Municipal Act, 1994, (Act No. 13 of 1994). Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995. Himachal Pradesh Municipal Business Bye-Laws, 2006. Jawahar Lal Nehru National Urban Renewal Mission (JNNURM).
4. Inadequate Energy Efficient measures & practices in building design & construction.	National Electricity Policy, 2005. National Electricity Act, 2003. Energy conservation Act, 2001. Environment Impact Assessment (EIA) Notification, September 14, 2006. National Urban Housing & Habitat Policy, 2007. Notification on Protection & Improvement of Quality of Environment in the Himalayas, 2001. Policy on Development of New Townships in Himachal Pradesh. The Himachal Pradesh Town & Country Planning Rules, 1978. Himachal Pradesh Town & Country Planning (Amendment) Rules, 2009. Shimla Urban Transport Management Society (SUTMS).
5. Inadequate Energy Efficient measures & practices in transport sector.	National Urban Transport Policy The Air (Prevention & Control of Pollution) Act ,1981/1987 Environment Impact Assessment (EIA) Notification, September 14, 2006 Notification on Protection & Improvement of Quality of Environment in the Himalayas, 2001 Transport Policy The Himachal Pradesh Town & Country Planning Rules, 1978 Himachal Pradesh Town & Country Planning (Amendment) Rules, 2009 Himachal Pradesh Municipal Business Bye-Laws, 2006
6. Lack of equity in provision of services.	Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT Accelerated Urban Water Supply Programme (AUWSP) Interest Subsidy Scheme for Housing the Urban Poor (ISSHUP *Rajiv Awaas Yojana* Jawahar Lal Nehru National Urban Renewal Mission (JNNURM)

Issues	Policies/Plans/Programmes
	Environment Improvement of Urban Slums (EIUS) *Swarna Jayanti Shahri Rojgar Yojana* Rajiv Gandhi Urban Renewal Facility (RGURF) Hand Pumps Installation Programme Special Component Plan (SCP) renamed as Scheduled Castes Sub Plan (SCSP) for the Scheduled Castes

Pressure on account of increasing gaps and slow implementation of policies, programmes, plans and projects is leading to emergence of sector specific issues and risks/impacts. An analysis of the issues, causes and impacts has been carried out and summarised in Table 22.

Table 22: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Inadequate Water Supply.	Increase in urban population. Migration from rural to urban areas. Increasing gaps between demand & supply. Remoteness & inaccessibility of habitation. Scanty & uneven distribution of rainfall. Siltation of water bodies.	Increased pressure on existing water resources.
2. Inadequate Sewerage System.	Inadequate Sewerage network coverage (between new & old cities/towns). Poor sanitary conditions in towns/wards, which are not covered by sewerage networks. Inadequate/improper treatment & disposal of sewage.	Pollution of water sources from disposal of untreated sewage.
3. Inadequate Solid Waste Management.	Poor sanitary conditions in towns/wards, which are not covered by Solid Waste Management services.	Increased instances of outbreak of diseases, like diarrhoea & malaria, etc due to indiscriminate dumping & improper disposal of solid waste, for instance, incineration.
4. Inadequate Energy Efficient measures & practices in building design & construction.	Use of wood/fuel in heating of buildings(residential/commercial). Understanding of Energy Conservation Building Code is limited. Energy Conservation Building code being voluntary for its adoption & implementation has a tardy pace of implementation in Himachal Pradesh. Understanding of new & renewable energy sources is limited. High cost of setting up & operating appliances & equipments run on new and renewable energy sources.	Increased energy demand.

5. Inadequate Energy Efficient measures & practices in transport sector.	Dependence on road transport in the urban transport planning in view of the hilly terrain. Limited options for alternate modes of transport. High cost of fuels in remote & inaccessible areas in HP due to high transportation costs. Preference for diesel in transport sector.	Inclusive growth may not be achieved due to inadequate interventions for improvement of public & non-motorised transport. It will make the services inaccessible to the poorer sections of society, who are the major users of these modes. It will also decrease productivity (due to increased congestion) & poor safety on the road. Increased use of rail freight, non-motorised & public transport modes & introduction of cleaner vehicles & fuels may contribute greatly to air pollution. Energy Security may be jeopardised because of increased fuel consumption. Non Conformity to the emission standards.
6. Lack of equity in provision of services.	Inadequate focus on planning basic services for urban poor.	Continued alienation of urban poor & inaccessibility & high cost of accessibility to the basic urban services for the poor.

3.11 Municipal Solid Waste

Increasing gap in Municipal Solid Waste generation versus collection, treatment and disposal (rural and urban) is leading to increased pollution load: The gap in rural and urban Municipal Solid Waste generation, collection and treatment at State level is about 758 and 185 tonnes per day (tpd), respectively. At district level, it ranges from 4.2 tpd in Lahaul and Spiti to 157.7 tpd in Kangra in rural areas. Similarly, it ranges from 4.8 tpd in Bilaspur and Kullu to 104.5 tpd in Solan in urban areas.

Increased public health risk due to discharge and disposal of untreated waste on land and in water bodies: Both surface and groundwater quality is deteriorating due to extensive and severe pollution from domestic and agricultural sources. The point sources of untreated Municipal Solid Waste and diffused sources of pollutants deteriorate the quality of surface and groundwater. Nearly all traditional sources are contaminated in the State due to unhygienic methods of handling water. At the State level, cases of hospitalisation due to diarrhoea increased from 16,263 in 1995 to 16,602 in 2002. Similarly, cases of hospitalisation due to hepatitis increased from 379 in 1995 to 421 in 2002. At district level, Chamba, Hamirpur, Kinnaur, Kullu, Lahaul and Spiti, Mandi, Sirmaur and Una reported increase in hospitalisation due to diarrhoea during 1995 to 2002. Similarly, Bilaspur, Chamba, Kangra, Kinnaur and Una reported increase in hospitalisation due to hepatitis during 1995 to 2002.

Increased public health risks due to solid waste littering and improper disposal (Municipal Solid Waste collection, treatment and disposal) at trekking routes, tourist units/circuits/destinations/religious places/heritage sites/trekking and transportation routes: The expected additional MSW generation due to tourist arrivals will exceed 3479 tons per day in 2011 and 5354 tons per day in 2021 in the top

tourist destinations. Vulnerability analysis indicates that sewage infrastructure in Shimla, Kangra and Chamba districts, Kullu, Ghumarwin and Sadar Tehsil in Bilaspur District is already under stress. Additional tourist load will increase pressure on existing waste infrastructure.

Municipal Solid Waste littering in the vicinity of catchment areas of water bodies leads to pollution: Infrastructure development and poor management of waste (municipal solid waste and waste water) in the catchment and in vicinity of wetland/water bodies / reservoirs leads to water pollution and increased influx of organic waste, which lead to water pollution and eutrophication.

Poor segregation of Municipal Solid Waste at source: Due to lack of segregation of Municipal Solid Waste at source or even at the collection site, along with difficult terrain and climate conditions, limit the technical options available for their treatment and disposal.

Inadequate finances to accelerate / upgrade / implement Municipal Solid Waste / Sanitation infrastructure leads to poor sanitation: There is no separate sanitation fee charged for augmenting and financing the Municipal Solid Waste infrastructure in the State. Existing financial/cost recovery mechanisms cannot cater to improved services delivery. Economic incentives and subsidies have not been beneficial in terms of promoting Solid Waste Management. The result in all sectors has been higher consumption and insufficient cost recovery for sanitation.

Gaps in Institutional Mechanisms related to Municipal Solid Waste / Sanitation leads to reduced efficiency: A number of agencies are involved at the State, district, *tehsil* and village level for management of MSW/sanitation. Lack of coordination and integrated planning leads to gaps in infrastructure development and operational inefficiency.

Inadequate Private Sector/PRI participation in Municipal Solid Waste / Sanitation sector leads to reduced coverage of sanitation services: Lack of private and Panchayati Raj Institution participation in waste collection and treatment is indicative of gaps in Policy implementation. Besides PRIs, Sanitation Committees are an alternative institutional mechanism being suggested, though relationship between them and PRI bodies is not yet clearly articulated. Participation of NGOs might be limited on account of their technical deficiencies, while large-scale Private Sector participation is unlikely until new policies are firmly in place.

Inadequate awareness leads to few community / Non Government Organizations participation in Municipal Solid Waste service and sanitation: Since the Government has the responsibility for providing sanitation services, community initiatives are minimal in the sanitation sector. Under difficult terrain and dispersed habitation, managing a sanitation service can become very expensive if sufficient social development input is not provided. There are few NGOs working in the area of sanitation.

Inadequacy of skilled personnel in MSW managements: Informal sector operations over the complete MSW management starting from collection, transportation, recovery and recycling is leading to resource loss, increased pollution load and failure of sustainability of formal MSW business model.

Inadequate sites for Solid Waste Management facility: - The Department of Urban Development is facing the problem of garbage disposal or treatment facility sites. The garbage being generated in the urban areas has to be handled in a proper manner so that the environment could be saved. This Department has made its best efforts to implement the Solid Waste Management Projects. The Solid Waste Management Projects are being presently implemented in seventeen Urban Local Bodies of the Pradesh. As per MSW Rule, 2000, there are special provisions for site selection in hilly areas, i.e., cities and towns

located on hills shall have location-specific methods evolved for final disposal of solid wastes by the Municipal authority with the approval of the concerned State Board or the Committee. The Municipal authority shall set up processing facilities for the utilisation of biodegradable organic wastes. The inert and non-biodegradable waste shall be used for building roads or filling-up of appropriate areas on hills. Because of constraints in finding adequate land in hilly areas, wastes not suitable for road-laying or filling up shall be disposed off in specially designed landfills.

Waste management sector and cross sector policy and regulatory framework at State level shows the intent of the State Government to address inadequate service delivery and quality in order to not only reduce the demand and supply gap and disease burden, but also sustain the sector. A mapping of the issues, policies and programmes framework is described in Box 12.

Box 12: Policies Mapped with the Issues in Waste Management Sector

Issues	Policies/Plans/Programmes
1. Increasing gap in Municipal Solid Waste generation versus collection, treatment & disposal (rural & urban) leading to increased pollution load.	National Urban Sanitation Policy National Rural Health Mission Municipal Solid Waste (Management, Handling & Trans-boundary Movement) Rules, 2000 State Water Policy, 2003 Tourism Policy, 2005 HP Municipal Act, 1994 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 Air (Prevention and Control of Pollution) Act, 1981 Water Act, 1974 State Sector Reforms, 1999 EIUS/IHDSP/UIDSMT/RGURF/JNNURM Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign HP Non-Biodegradable (Control) Act HP Eco-tourism Policy
2. Increasing public health risk due to discharge & disposal of untreated waste on land & in water bodies.	National Rural Health Mission State Water Policy, 2003 Tourism Policy, 2005 HP Groundwater Pollution Act, 2005 State Sector Reforms, 1999 Health Vision, 2008 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 HP Non-Biodegradable Garbage (Control) Act, 1995 HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
3. Increased public health risks due to solid waste littering & improper disposal (Municipal Solid Waste Collection, Treatment & Disposal) at trekking routes, tourist units / destinations / circuits / religious places / heritage sites / trekking / transportation routes.	State Water Policy, 2003 Tourism Policy, 2005 State Sector Reforms, 1999 Health Vision, 2008 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 HP Non-Biodegradable Garbage (Control) Act, 1995

Issues	Policies/Plans/Programmes
	HP Municipal Act, 1994/HP Municipal Bye-Law, 2006 EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign
4. Municipal Solid Waste littering in the vicinity of catchment areas of water bodies leading to pollution.	National Urban Sanitation Policy National Rural Health Mission Municipal Solid Waste (Management, Handling & Trans-boundary Movement) Rules, 2000 State Water Policy, 2003 Tourism Policy, 2005 HP Municipal Act, 1994 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 Air (Prevention and Control of Pollution) Act, 1981 Water Air (Prevention and Control of Pollution) Act, 1974 State Sector Reforms, 1999 EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign HP Non-Biodegradable Waste (Control) Act, 1995 HP Eco-tourism Policy
5. Poor segregation of Municipal Solid Waste at the source.	Total Sanitation Campaign *Panchayati Raj* Act, 1994 Municipal Solid Waste (Management, Handling & Trans-boundary Movement) Rules State Sector Reforms, 1999 EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes
6. Inadequate finances to accelerate /upgrade/implement Municipal Solid Waste / Sanitation infrastructure leading to poor sanitation.	State Water Policy, 2003 Tourism Policy, 2005 State Sector Reforms Rural Tourism Infrastructure Development Scheme EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Total Sanitation Campaign Schemes to support PPP in infrastructure projects
7. Gaps in Institutional Mechanisms related to Municipal Solid Waste /sanitation leading to reduced efficiency.	State Water Policy,2003 Tourism Policy, 2005 State Sector Reforms Rural Tourism Infrastructure Development Scheme EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Total Sanitation Campaign
8. Inadequate Private Sector/PRI participation in Municipal Solid Waste /Sanitation sector leads to reduced coverage of sanitation services.	State Water Policy, 2003 Tourism Policy, 2005 State Sector Reforms, 1999 *Panchayati Raj* Act, 1994 Rural Tourism Infrastructure Development Scheme EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes

Issues	Policies/Plans/Programmes
	Total Sanitation Campaign Schemes to support PPP in infrastructure projects
9. Inadequate awareness leading to low community/NGO participation in Municipal Solid Waste service & sanitation.	State Water Policy, 2003 Tourism Policy, 2005 State Sector Reforms, 1999 *Panchayati Raj* Act, 1994
10. Lack of skilled personnel in MSW management.	National Urban Sanitation Policy National Rural Health Mission Municipal Solid Waste (Management & Handling) Rules State Water Policy, 2003 Tourism Policy, 2005 HP Municipal Act, 1994 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 Air (Prevention and Control of Pollution) Act Water(Prevention and Control of Pollution) Act State Sector Reforms EIUS/IHDSP/UIDSMT/RGURF/JNNURM Schemes Rural Tourism Infrastructure Development Scheme Total Sanitation Campaign HP Non-Biodegradable (Control) Act, 1995 HP Eco-tourism Policy
11. Lack of sites for setting up Solid Waste Management Facilities.	MSW Rule 2000 HP Municipal Act, 1994 HP Town and Country Planning Act, 1977 *Panchayati Raj* Act, 1994 Air (Prevention and Control of Pollution) Act, 1981

An analysis of the issues, causes and impacts has been carried out and summarised in Table 23.

Table 23: Issues, Causes and Impacts/Risk

Issues		Impacts/Risks
1. Increasing gap in Municipal Solid Waste generation versus collection, treatment & disposal (rural & urban) leading to increased pollution.	Increased Municipal Solid Waste generation from population / tourists/industries. Inadequate availability of infrastructure.	Increased pollution. Increased disease burden/health
2. Increased public health risks due to discharge & disposal of untreated waste on land and in water bodies.	Environmental pollution due to unscientific Municipal Solid Waste ingress in water sources. Unhygienic methods of handling Poor waste management.	Increased incidence of diseases. Public health risks.
3. Increased public health risks due to solid waste littering & improper disposal (Municipal Solid Waste collection, treatment & disposal) at tourist units/destinations/circuits religious places / heritage sites /t rekking & transport routes.	Inadequate sanitation infrastructure (rural & urban). Unregulated tourist transit points. Drinking water source/transmission and distribution coming in contact with Municipal solid waste.	Increased disease burden/ mortality.

Issues	Causes	Impacts/Risks
4. MSW littering in the vicinity of catchment areas of water bodies leading to pollution.	Lack of MSW monitoring. Independent infrastructure for MSW management.	Resource loss. Catchment degradation/Water pollution.
5. Poor segregation of Municipal Solid Waste at source.	Lack of awareness, consumer behaviour, variation in Municipal Solid Waste compression. Unavailability of technology at source of segregation.	Increased pollution. Reduced resource recovery.
6. Inadequate finance to accelerate/upgrade/implement Municipal Solid Waste /sanitation infrastructure leading to poor sanitation.	Inadequate pricing of resource. Continued subsidy. Resource under-valuation. Government expenditure.	Increased pollution due to inadequate infrastructure.
7. Gaps in mechanism related to Municipal Solid Waste /sanitation leading to reduced efficiency.	Inadequate implementation of reforms. Inadequate integrated planning & coordination.	Gaps in service delivery. Increased pollution.
8. Inadequate Private Sector/PRI participation in Municipal Solid Waste /sanitation sector leading to reduced coverage of sanitation services.	Inadequate implementation of reforms. Lack of a business model.	Reduced infrastructure development. Gaps in service delivery Increased pollution.
9. Inadequate awareness leading to low community/NGO participation in Municipal Solid Waste service & sanitation.	Inadequate ownership. Difficult terrain & dispersed location. Inadequate gender participation. Inadequate NGOs participation.	Unhygienic living conditions /disease burden. Increased Government expenditure for sanitation management . Increased pollution.
10. Lack of skilled personnel in MSW management.	Inadequate regulatory compliance. Inadequate participatory approach.	Loss of valuable resource. Failure of formal sector MSW financial model. Increased pollution due to MSW treatment & disposal in informal sector.
11. Lack of sites for setting up Solid Waste Management Facilities.	Non-availability of land. Inadequate planning.	Unhygienic living conditions/ disease burden. Increased pollution due to inadequate infrastructure.

3.12 Hazardous Waste

Environment and Social issues related to hazardous waste from Industries are improper siting of industries, impact on air quality, impact on water quality and quantity, inadequate hazardous waste treatment and disposal, land degradation, impact on flora and fauna, limited technological options to switch to green/clean technologies and occupational health of workers in industries handling hazardous waste.

Improper siting of industries: Industrial Areas in Himachal Pradesh located on the border areas adjoining Punjab, Haryana, Chandigarh, Uttarakhand and Jammu and Kashmir have attracted a large number of projects. This is especially so in case of Industrial Areas of Baddi, Barotiwala, and Parwanoo in Solan district; Mehatpur, Tahliwala and Amb in Una district; Paonta Sahib and Kala Amb Industrial Areas in Sirmaur district; Sansarpur Terrace in Kangra

district; and Golthai in Bilaspur district. Over 90 percent of the investments in the medium and large scale sector are in the pipeline and projects coming up in Himachal Pradesh are being implemented in these locations. Baddi, Barotiwala and Nalagarh areas in Solan district have come up as a destination, especially for Textile, Pharmaceutical, and Packaging industries. Himachal Pradesh State Pollution Control Board has prepared Zoning Atlas for Siting of Industries for all districts of the State; Industrial Estate Planning for Baddi, Barotiwala-Nalagarh in Solan district and Paonta Sahib in Sirmaur district; Sustainable Tourism Development of Dharamshala, McLeodganj and Bhagsunath areas of district Kangra; and State Environmental Atlas of Himachal Pradesh. The State Industrial Policy, 2004 states that preference will be given to develop activity specific Industrial Areas like Food Parks, Electronic City, Export Processing Zones, Export Promotion Parks, Bio-Technology Parks, Information Technology Parks, Textile Clusters, Pharma Clusters, Housing, Labour Colony, Business Centres, Multiplexes, etc. throughout the State, especially in the areas away from the border areas of the State and procedure for approval of the State Government under Section 118 of the Himachal Pradesh Land Reforms and Tenancy Act will be simplified and the approval process will be expedited. Top priority will also be given to link such existing Industrial Areas and new clusters with 'A' class quality road to provide efficient inter-State and intra-State connectivity.

Further, Department of Industries has created land banks (both private and Government land) in Solan, Una, Kangra, Sirmaur, Hamirpur, Bilaspur, Shimla and Mandi districts for attracting entrepreneurs and investors to set up industries. The siting of industries is being done as per the available land bank and not as per the Zoning Atlas for Industries. Moreover, Environment Impact Assessments has an inbuilt mechanism for site selection and has scope for assessing alternate sites as well.

Poor Ambient Air Quality: Air Quality Trends in Himachal Pradeshindicate that higher concentration of Suspended Particulate Matter in Paonta Sahib industrial area is contributed by industrial and construction activities and vehicle movements. Ambient Air quality at Baddi and Kala Amb (Industrial Areas) is very well within the prescribed standards with regard to concentration of gaseous pollutants. However, the concentration of Suspended Particulate Matter (pollutants) earlier showing increasing trend has shown marginal improvement during the preceding months, which is mainly due to increased infrastructure construction activities in the area.

Removal of vegetation from the area designated for mining and other purposes including Treatment, Storage & Disposal Facility (TSDF) produces dust, which, when air-borne, causes an increase in the concentration of SPM in the surrounding areas. Removal, handling, transportation and storage of soils also cause an increase in the concentration of Suspended Particulate Matter in the atmosphere. The use of diesel equipment in these activities causes an increase in the level of Oxides of Nitrogen (NOx) and Sulphur dioxide (SO_2). Drilling and blasting of overburden and mineral contribute SPM and explosive fumes into the atmosphere.

Deteriorating water quality and quantity: With the increasing population, urbanisation and industrialisation, it is becoming difficult to provide adequate amount of water to the users. At the same time, the problem of water quality has cropped up and has become more important in the recent years rather than quantity of water. It is almost impossible to find pure water in nature as water being a universal solvent readily dissolves and collects all kinds of impurities, but the crux of the problem lies in the contamination that is taking place due to human activities. The pollution by human activities emanating either from the use of water for domestic or industrial purposes or as a result of ever increasing rate at which organic or inorganic chemicals, pesticides, heavy metals are being used and are being

released into the atmosphere or over land, whereby they are able to enter the water cycle, have degraded our water resources to a large extent. The industrialisation coupled with discharge of untreated sewage is responsible for deterioration in water quality.

In the industrial areas of Baddi, Barotiwala, Nalagarh, Kala Amb and Parwanoo, the water quality of rivers Sirsa, Markanda and Sukhna *nallah* is categorised as 'D' because of low levels of oxygen due to organic pollution. River Sirsa is categorised as A to D because industrial and domestic effluents pollute the river in Baddi, Barotiwala and Nalagarh region. River Sukhana is categorised as 'D' because industrial and domestic effluents pollute the river in Downstream of the Parwanoo town.

Inadequate Hazardous Waste Treatment, Storage and Disposal facility: For effective management of hazardous waste, the Government of Himachal Pradesh has notified a Treatment, Storage & Disposal Facility (TSDF) site near village Majra, *tehsil* Nalagarh, district Solan (Himachal Pradesh) vide letter No-Ind-A (F) 15-4/2003-11, dated 07.03.2007. Hazardous waste in Himachal Pradesh comprises sludge from Effluent Treatment Plant, Waste Oil, Contaminated Containers, Others (Residual wastes) and Process Residue. Management/mode of disposal of sludge from Effluent Treatment Plant is 22325 MT/year and other residual wastes are secured through onsite storage, while used oil measuring 1073 KL/year and process residue amounting to 3049 MT/year are recycled. Contaminated containers numbering 339444 per year are also recycled/reused after cleaning and 13028 MT of other wastes are generated per year.

Out of total of 38402 MT of hazardous waste generated every year, except oil and contaminated containers, about 587 MT/Y is incinerated; 11658 MT/Y is sent to Treatment, Storage and Disposal Facility; 19784 MT/Y is recycled and 6373 MT/Year of slag disposed off in low lying areas/brick kiln/road construction/partly to Treatment, Storage and Disposal Facility. Though hazardous wastes from industries gets treated/disposed off/recycled, household hazardous waste, e.g., dry cell, batteries, tetra packs, packets of snacks food, plastic waste, pet bottles add to the pollution load leading to disposal problem.

Hazardous Wastes generated by the industries are usually a by-product of industrial operations, which involve heavy metals such as arsenic, cadmium, chromium, lead, mercury etc; processes, which utilise different categories of oil and petrochemicals; products, such as Poly Vinyl Chloride and plastics; waste products from photocopiers; chemicals, such as Polychlorobiphenyls; and finally, by-products, such as dioxins and furans, which are now recognised as extremely toxic substances, affecting all forms of life. As per the report of High Powered Committee (HPC) on Hazardous Wastes set up by the Government of India, Himachal Pradesh generates 2159 Tonnes per Annum (TPA) of Hazardous Waste against a national total of 4415954 TPA. Waste generated from Pulp and Paper Industry and Calcium Carbide Industry of Paonta and Kala Amb area is being recycled.

Land degradation: Topography and land use change due to setting up of TSDFs/CETPs; digging of open pits and dumping of overburden rock mass in the form of heaps. The land use pattern undergoes a change due to the use of the land for mining, dumping and TSDF activities. The land use in the surrounding areas is also affected due to the impact of mining on water regime. Polluted water from pits affects the characteristics of the topsoil, thereby affecting the end use. The damage pattern on the surface undergoes a change due to alterations in the surface topography due to mining and setting up and activities of TSDF/CETP facilities.

Loss of Flora and Fauna: Removal of all vegetation (flora) and fauna from the area is required for mining and other purposes including setting up of TSDF and CETP facilities. Pollution of water in the surrounding water bodies, due to flow of debris on the slope, affect the aquatic ecology of water bodies. Dust in the atmosphere is contributed by mining and TSDF activities. Dust, when

deposited on the leaves of the plants in the surrounding areas, retards their growth.

Limited technological options to switch to green/clean technologies: Industries based socio-economic development in Himachal Pradesh has exerted pressure on raw materials, like water, minerals, forest produce. Capability and skills to manage the natural resources optimally are limited and is further compounded by the lack of adequate and skilled human resources to manage the natural resources optimally. Adoption of cleaner modes of production can help in natural resource conservation and elimination of gaseous, liquid or solid hazardous wastes, reduction by reduced consumption of raw materials, modification and upgradation of the technological processes, so that optimal utilisation of natural resources is made possible, and helps in adoption of preventive rather than corrective approaches to pollution control arising out of hazardous waste generation.

Occupational health of workers in industries handling hazardous waste: Data from the labour bureau, Government of Himachal Pradesh, indicate negligible occurrence of 'occupational disease' as per Factory Act, 1948. This has been attributed to low level of reporting both by employers or employee to the respective agency. However, the Comprehensive Environmental Pollution Index data from CPCB and hospitalisation statistics for districts having major industries in Himachal Pradesh indirectly indicate occupational health issues related to industrial workers.

Mercury waste/Mercury contaminated waste management and disposal: There is no data available on Mercury waste/Mercury contaminated waste management and disposal in Himachal Pradesh. But, Mercury waste/Mercury contaminated waste management and disposal is one of the issues.

Industries and Hazardous Waste Management sector and State level cross sector Policy and Regulatory Frameworks shows the intent of the State Government to address the issues related to improper siting of industries, poor ambient air quality, deteriorating water quality and quantity, inadequate hazardous waste treatment and disposal, land degradation, loss of flora and fauna and limited technological options to switch to green/clean technologies. A mapping of the issue, policy and programme framework is described in Box 13.

Box 13: Policies Mapped with Issues in Hazardous Waste Sector

Issues	Policy/Plan/Programme
1. Improper siting of industries.	Environment (Siting for Industrial Projects) Rules Environment (Protection) Act,1986 EIA Notification, 2006 & Amendments Zoning Atlas Critically Polluted Areas identified by CPCB Comprehensive Environment Pollution Index (CEPI) developed by CPCB & MoEF
2. Poor Ambient Air Quality.	Environment (Protection) Act, 1986 The Air (Preservation & Control of Pollution) Act, 1981 NAAQS
3. Deteriorating water quality & quantity.	Environment (Protection) Act Water (Prevention & Control of Pollution) Act, 1974 Hazardous Wastes (Management, Handling & Trans-boundary) Rules, 2000
4. Inadequate hazardous waste treatment & disposal.	Land Acquisition Act1894 & 1985 Forest Conservation Act, 1980 Hazardous Wastes (Management, Handling & Trans-boundary) Rules, 2000
5. Land degradation.	Forest Conservation Act, 1980 Environment Protection Act, 1986 Hazardous Wastes (Management, Handling & Trans-boundary) Rules, 2000

6. Loss of Flora & Fauna.	Mining Policy Industrial Policy Forest Sector Policy
7. Limited technological options to switch to green/clean technologies.	Industry Policy 2004, Himachal Pradesh
8. Occupational health of workers in industries handling hazardous waste.	Air (Prevention & Control of Pollution) Act, 1981 Water (Prevention & Control of Pollution) Act, 1974 Municipal Solid Waste (Management, Handling & Trans-boundary Movement) Rules Hazardous (Management Handling & Trans-boundary) Rules, 2000 Factory Act
9. Mercury waste/Mercury contaminated waste management & disposal.	Hazardous (Management Handling & Trans-boundary) Rules, 2008 Water (Prevention & Control of Pollution) Act, 1974

The identification of issues and analysis have been summarised in Table 24.

Table 24: Issues, Causes and Impacts/Risk

Issues	Causes	Impacts/Risks
1. Improper siting of industries.	Concentration of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. The siting of industries is being done as per the available land bank & not as per the Zoning Atlas for industries.	Over extraction of mineral resources & generation of hazardous waste.
2. Poor Ambient Air Quality.	Concentration of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. Ancillary development in the industrial areas, including urban infrastructure entailing construction activities, vehicular & industrial emissions.	Accidence of National Ambient Air quality Standards (NAAQS). Impact on human health, particularly that of industrial workers.
3. Deteriorating water quality & quantity.	Concentration of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. Ancillary development in the industrial areas, including urban infrastructure entailing construction activities, improper discharge of industrial effluents (treated/untreated), sewage & Municipal solid wastes. Deeper excavation on the surface or underground digging. Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances, which cause water pollution. Mining activities increase suspended solids and chemical contamination in the water at the site and downstream .	Further, deterioration of water quality in terms of benchmarks set in Primary Water Quality Criteria & Designated Best Use of Fresh Waters (A-E). Water table decreases locally, often drastically, resulting in the drying up of wells & springs in the neighbourhood. Adverse impact on water users and the aquatic ecosystem. The impact is particularly significant if water users downstream of the site are abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.
4. Inadequate hazardous waste treatment & disposal.	Congregation of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. Hazardous Waste in Himachal Pradesh comprises sludge from Effluent Treatment Plant, Waste Oil, Contaminated Containers,	Gaps between hazardous waste generation & treatment may increase further leading to deterioration of water quality.

Issues	Causes	Impacts/Risks
	Others (Residual wastes) & Process Residue. Gaps in hazardous waste generation & treatment. Inadequate number of Common Effluent Treatment Plant (Copts) & treatment, e.g., there is no CETP.	
5. Land degradation.	The land use pattern undergoes a change due to the use of the land for mining, excavation, dumping & other associated activities. Digging of open pits and dumping of overburden rock mass in the form of heaps. Polluted water from pits affecting the characteristics of the topsoil, thereby affecting the end use. The damage pattern on the surface undergoes a change due to alterations in the surface topography due to mining & associated activities.	The land use in the surrounding areas is affected due to the impact of mining on water regime. Change in value of the land & surrounding areas.
6. Loss of Flora & Fauna.	Removal of all vegetation (flora) & fauna from the area for mining & other purposes. Pollution of water in the surrounding water bodies due to flow of debris on the slope, thereby affecting the aquatic ecology of water bodies. Dust in the atmosphere is contributed by mining and associated activities. Dust, when deposited on the leaves of the plants in the surrounding areas, retards their growth.	Loss of natural vegetation cover by clear felling, smothering & dust.
7 Limited technological options to switch to green/clean technologies.	Inadequate incentives for setting up/switching to green/clean technologies. Inadequate understanding of green/clean technologies, which could be introduced in Himachal Pradesh.	Deterioration of baseline environmental conditions of land, water, air & noise. Increased capital cost & investment for setting up/switching to green/clean technologies.
8 Occupational health of workers in industries handling hazardous waste.	Inadequate usage of PPE. Inadequate safety systems in industries.	Increased health risks/disease burden.
9. Mercury waste/Mercury contaminated waste management & disposal.	Inadequate safety system in industries. Inadequate hazardous waste management system.	Deterioration of baseline environmental conditions of land, water & air. Increased health risks/ disease burden.

Chapter 4: Good Practices

4.0 Tourism Art & Culture

Providing safe drinking water at tourist transit points / dhabas by disinfecting drinking water with sodium hyochlorite and chlorinated isocyanurates is one of the best practice to keep safe the health of the people.
Source: UNICEF, Promotion of Household Water Treatment and Safe Storage in UNICEF Wash Programmes, January 2008.

Other good practices for safe drinking water are such as Flocculation/coagulation and time released disinfection all combined in a single product, e.g., powder in a sachet, has been found to be highly effective for complete microbial protection when used for water purification at tourist transit points/campsites/trekking-routes/*dhabas*.
Source: Managing Water in the Home: Accelerated Health Gains from Improved Water Supply, World Health Organisation.

Provision of Ferro cement tanks for water storage at tourist transit points not only provide improved access to water, but also results in improvement of hygiene and reduction of diseases.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, a report by Oxfam, New Zealand.

At tourist transit points/*dhabas* in rural areas, the water sources, e.g., spring can be protected by constructing a concrete base around it. This will not only protect water from the solid waste scattered around it, but it will also enable quick collection of water for usage.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, a report by Oxfam, New Zealand.

At tourist transit points/*dhabas*, there should be provision of compost pits for the disposal of biodegradable solid and food wastes, which, otherwise, is disposed outside the households in rural areas. This practice has been found to prevent contamination from flies. Provision of trash bins at selected places has been found to divert rubbish at one place for disposal.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, a report by Oxfam, New Zealand.

Low Cost Sanitation for Tourist Transit Point (Stand alone/ Community/ *Dhaba*/ Cluster based): Low cost sanitation provides solution for safe disposal of human excreta on-site. Flush compost toilet, a recommended on-site solution, is eco-friendly, technically appropriate, socio-culturally acceptable and economically affordable. It is an indigenous technology and the toilet can easily be constructed by local labour and materials. It consists of a pan with a steep slope of 25°-28° and an especially designed trap with 20 mm water seal requiring only 1.5 to 2 litres of water for flushing, thus helping conserve water. There is no need for scavengers to clean the pits. There are two pits of varying sizes and capacities, depending on the number of users. The capacity of each pit is normally designed for 3 years' usage. Both pits are used alternately. When one pit is full, the incoming excreta is diverted into the second pit. In about two years, the sludge gets digested and is almost dry and pathogen free, thus safe for handling as manure. Digested sludge is odourless and is a good manure and soil-conditioner. It can be dug out easily and used for agricultural purposes.

When constructed in homogeneous soil, horizontally, bacteria do not travel more than three metres and vertically, the seepage is not more than one meter. If there is a tube-well or hand pump sunk in immediate vicinity, the first joint should be lower than the limit of the vertical seepage. No vent pipe is needed since the gas gets absorbed in the soil facing the chamber, as the brick lining inside is in lattice formation. It needs less space than a septic tank toilet system. The cost of construction falls within a range of $10 to $1000.

Source:http://www.sulabhinternational.org/st/advantages_sulabh_toilets.php

Development of Tourism/Eco-tourism Master Plan: Tourism planning should be undertaken as part of the overall development plan for any area (including its land-use plan), and should not be undertaken in isolation. Ensure that wherever tourism occurs or is liable to occur, the corresponding land-use plan should include a component of tourism land-use, carefully zoning the areas with regard to the type of tourism that should take place: high, middle or low intensity. Zoning is a tool required in any land or water-use plan and should always be used to regulate utilisation of the land and water resources over the long term. A good example of a comprehensive tourism zoning plan includes specific zones, such as:

Case Study-1: The Ecotourism Master Plan for the southern coast of the Red Sea in Egypt, carried out in 1997 for the Government of Egypt, comprised a careful zoning scheme, including strictly-protected, restricted, moderate tourism and semi-intensive tourism zones. The objective of the Master Plan was to provide a sustainable tourism development model for a strip of 215 km in the southern portion of the coast, very different from what has been occurring in the central part of the Red Sea littoral, where unplanned and uncontrolled tourism development is causing all kinds of environmental catastrophes. The Master Plan is being enforced, and implemented to achieve environmentally sustainable eco-touris

a) strictly protected zone (sometimes called 'sanctuary' or 'absolute reserve' zones), where the presence of all types of tourists and tourist infrastructure are strictly prohibited;

b) restricted tourism zone (sometimes called 'wilderness' zone), where access is allowed only to a limited number of tourists, usually on foot (or, in some cases, by rowboat);

c) moderate tourism zone, where visitors are encouraged to carry out diverse low-impact activities compatible with the natural and/or cultural environment;

d) semi-intensive tourism development zone, which should always be an area of limited access (especially when near environmentally-sensitive natural areas), where some moderate-impact facilities are included (e.g., eco-lodge, visitor centre, limited parking areas);

e) Intensive tourism development zone, which should only occur in highly popular mass tourism destinations (e.g. beach and ski resorts, amusement and theme parks), where a considerable degree of concentration of tourists and tourist facilities takes place. Planning should endeavour to minimise negative impacts, including pollution of air, water, and soil resources. As part of Tourism Master Plan, water supply, sewage and municipal solid waste should be included as important components.

Source: Integrating Biodiversity into the Tourism Sector/Best Practice Guidelines, www.uneptie.org/tourism/bestprac.html.

Eco-design of Tourism Facility, Energy Conservation, Bio-climatic Design and Alternative Energy Sources: This new approach should be based on the concept of *eco-design*, which may be defined as "any form of design that minimises negative environmental impacts by integrating itself into the surrounding ecosystem."

Case Study-2: Overall environmental performance, the 19-level Novotel at Homebush Bay in Sydney was built for the 2000 Olympics. A commitment to the principles of Ecologically Sustainable Development (ESD) meant that the building set new standards for high-rise hotel accommodation. The hotel purchases 100 percent green power, thus, saving 1200 tonnes of carbon dioxide emissions each year. More than 400 m² of solar collectors power one of Australia's largest solar hot water systems, reducing energy consumption by up to 40 percent. Environmentally-minded designs include toilets with recycled water and waste separation at the room cleaning stage.

Case Study-3: Disney World in Florida recycles fifteen million litres of wastewater a day for irrigation of landscaping and golf courses. The company found that this method was not only environmentally wise, but also cost-effective, as using municipally treated water would have been much more expensive.

- Apply bio-climatic design criteria, which means understanding the physical setting of the facility, the local climate including prevailing winds, solar radiation, appropriate local materials, biodegradation, surrounding vegetation etc.
- Consider the sun's positioning when choosing the orientation of tourism facility so as to maximise the use of natural light and trap incoming solar radiation to heat interior

spaces, taking note that in the northern hemisphere, the sun is mainly shining from the south.

- To maximise 'solar window', the slope of the roof (in degrees) should be roughly equal to the latitude of the site.
- Analyse in each case, the convenience of applying solar energy for heating water and for generating electricity (photovoltaic systems), as well as other alternative, environment-friendly energy sources, such as wind power, biomass etc.
- Overhaul the entire lighting system by replacing incandescent bulbs by CFLs.
- As regards waste management, always apply the quadruple principle: recycle, reuse, refuse and reduce. Reuse wastewater (both grey and black) as much as possible. Create systems in which water goes through several uses before being disposed off, utilising it for flushing toilets, and as irrigation or fertiliser for cultivations (whenever possible). Always avoid using potable water for irrigating. In case of re-using both gray and black waters, separate lines and septic systems must be installed.
- Set up a waste separation programme that ensures the separation of paper, aluminium, organic waste from kitchen and garden, glass, batteries, and other hazardous waste substances. Whenever possible, convert biodegradable waste to compost, utilise the biomass or submit the waste to digestive anaerobic systems.
- Try to use biodegradation practices as much as possible. In the process of biodegradation, micro-organisms break down the products of other biodegradable materials and incorporate them back into the ecosystem. Biodegradable or bioconvertible material includes anything that is organic.
- Saving water and energy by reducing the number of towels used in hotel rooms has made a difference in hotels around the world.
- To avoid pollution from water discharge, replaced chlorine with baking soda and salt solution in the pools.
- Consider using special devices to reduce water consumption in such key areas as bathrooms, showers, lavatories, etc.
- For instance, an inefficient shower or sprinkler can use up to 20-30 liters of water per minute, whereas an efficient one can provide good water supply with a strong jet spray using only five liters per minute.
- Encourage customers and employees in tourist destinations to turn off lights when not needed, as well as TV sets and computer voltage regulators and everything else that is not being used at the time.
- Rechargeable batteries offer more cost-efficient alternatives for saving energy and cutting down on expenses. A rechargeable battery replaces approximately 100 disposable batteries.

Source: www.uneptie.org/tourism/bestprac.html, Integrating Biodiversity into the Tourism Sector / Best Practice Guideline; National Environment Commission, Royal Government of Bhutan, August 2004/Environmental Code of Practice/Tourism Activities; Guide for Sustainable Tourism Best Practices.

Development and Implementation of Code of Environmental Conduct for Tourists/ Trekkers under Eco-tourism: In the absence of code of conduct for eco-tourism and trekkers/campsites wase litter and unhygienic practices are common at tourist points. Therefore, a simple code of conduct can be developed and implemented in the State under ecotourism. An example of following code of conduct is at Sikkin, where, a code of conduct leaflet was developed by the local community at Yuksam, Sikkim and implemented to promote eco-tourism. Some of the basic do's and don'ts of eco-tourism that can be promoted are listed below:

Do's

- Carry back all non-biodegradable litter, such as empty bottles, tins, plastic bags off etc. These must not litter in the environment or be buried. They must be disposed in municipal dustbins only.
- Observe the sanctity of holy sites, temples and local cultures.
- Cut noise pollution. Do not blare aloud radios, tape recorders or other electronic entertainment equipments in nature resorts, sanctuaries and wildlife parks.

- In case temporary toilets are set-up near campsites, after defecation, cover with mud or sand.
- Leave all camps and trails clean.
- Separate and properly dispose off litter. Bury biodegradables, and carry out all other non-biodegradable materials for deposit at designated trash sites or for recycling. Use toilet tents on all treks. Set up and use toilet tents at least 100m away from water bodies to avoid water pollution.
- Use established campsites and kitchen sites and avoid trenching around tents.
- Avoid fuel-consumptive menu items, e.g., baked foods and large menu selections.
- Re-package food into reusable plastic containers to reduce waste.
- All visitors should only use designated campsites approved by the Department of Tourism.
- If toilets are not provided, holes must be dug in designated areas and not randomly. This is required for sanitation reasons as well as to maintain the campsite.
- If kitchen huts are not provided at the campsite, then kitchen tents should be pitched in designated areas, away from the main tenting area. This is required in case of fire and also for hygiene.
- All biodegradable waste should be disposed off in a general waste pit. It should be disposed below snowline. Non bio-degradable waste should be carried and disposed off only at the designated sites. Photo documentation should be submitted in case of expedition.
- The use of detergent and chemical related substances should be kept at a minimum, so as to protect downstream users.
- Animals used for transport should be segregated and kept in designated areas, so as to protect campers and equipments.
- Surrounding plants and flowers must not be disturbed, so as to preserve the aesthetics of the local environment and landscape.
- Visitors must respect the customs and beliefs of the people in the area.
- Never litter. Always pack out trash and dispose at authorised places.
- Conserve natural and cultural heritage.
- Support local conservation efforts and income generation activities.

Don'ts

- Do not trample high altitude vegetation, do not pick any flowers or medicinal plants.
- Do not allow clients to purchase endangered animal parts or antique cultural artifacts.
- Do not take away flora and fauna in the form of cuttings, seeds or roots. It is illegal, especially in the Himalayas. The environment is really delicate in this region and the bio-diversity of the region has to be protected at all costs.
- Do not use pollutants, such as detergent, in streams or springs while washing and bathing.
- Do not use wood as fuel to cook food at the campsite.
- Do not leave cigarettes butts or make open fires in the forests.
- Do not consume aerated drinks, alcohol, drugs or any other intoxicant and throw bottles in the wild.
- Do not wash vehicles on the banks of lakes/rivers/ponds/water bodies.
- Polythene and plastics are non bio-degradable and unhealthy for the environment and must not be used and littered.

Source: Community Initiatives in Ecotourism: A Case Study from Sikkim, India, Environmental Code of Practice, Tourism Activities; National Environment Commission, Royal Government of Bhutan August 2004; Guidelines for Expenditure, Indian Mountaineering Foundation.

Safety and Security of Tourists/Heritage sites/Monuments: Special programmes to check anti social activities at tourist places/monuments and a 24x7 Tourist Help Line should be introduced for safety, security and assistance to the tourist.

Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Preservation and Conservation Including Pollution Control of Heritage Centres: This includes planning and implementation of restoration plan of the area in and around the heritage sites, and introduction of pollution free buses and decongestion of the area around the site. For example, in a bid to protect the world heritage site, Maharashtra Tourism Development Corporation (MTDC) has introduced special, pollution free luxury buses (5 AC and 5 Non-AC) on the 2.5 km long stretch of the Ajanta tour that begins at Fardapur. The MTDC authorities have also banned the use of all other vehicles in the area. The entire exercise is expected to reduce the vehicular traffic and pollution in the surrounding areas of the Ajanta caves. Parking of vehicles is not allowed near the caves, making the entire surrounding area eco-friendly and pollution free.

Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Eco-tourism Should be Strictly Regulated: No new area should be opened without thorough scrutiny and evaluation of its impact on the environment by the experts. For example, the Government of Uttarakhand has restricted the number of tourists visiting Gangotri to 150 per day.

Define Group Size: Small groups (6-10 persons) make for better communication, higher visitor experience quality, and lower impact. In case of increased demand, prepare a visit plan according to the capacity of your facilities. In these cases, the use of guides is highly recommended.

Case Study 4: Private Sector participation for eco-tourism, Jungle Lodges and Resorts (JLR) is a responsible wildlife and eco-tourism company with a strong commitment to use tourism as a genuine tool for conserving the environment and wildlife. The company provides accommodation in consultation with the Chief Wildlife Warden of the state. These sanctuaries are Bandipur National Park, Nagarhole National Park and a number of Karnataka's other wildlife sanctuaries, including tented camps on the Kali River in the Dandeli Wildlife Sanctuary and in the Biligiri Rangaswamy Wildlife Sanctuary. All of JLR's resorts and camps are located in some of Karnataka's ecologically sensitive yet amazing natural destinations. Clean and superior facilities, package deals and the Kabini River Lodge excellent cuisine have won Jungle Lodges & Resorts international acclaim. JLR has also been awarded as the Best Eco-tourism Company in India by the Prime Minister, Government of India in 1999.

Try establishing natural barriers, such as hedges to regulate the amount of noise and light issuing from facilities, particularly if building is within or near a highly sensitive protected area, such as nesting sites.

Do not, under any circumstances, feed local wildlife, because this practice fosters reliance on humans, alters their natural diet, and may encourage disease transmission.

Source: Guide for Sustainable Tourism Best Practices; Community Initiatives in Ecotourism: A Case Study from Sikkim, India, Environmental Code of Practice, Tourism Activities.

Public Private Partnership for Developing Tourist Infrastructure: In developing tourism products, infrastructure projects can be initiated through Build Operate and Transfer. Land Bank Scheme to create physical facility, earmarking certain land on the tourist places, wayside locations and State/National Highways for the tourism projects both in rural and urban areas are a few examples practiced in Gujarat. Another example in Gujarat where the Sardar Sarovar Narmada Nigam Ltd. has invited Private Sector participation for the development of infrastructure facilities with a view to create an attractive tourist destination in an area of 1400 ha of land, downstream of the Sardar Sarovar Dam consisting of light deciduous forest interspersed with lakes, grassland, streams, hillocks and rivulets.

Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Private Sector Participation for the Maintenance of Tourism-friendly Monuments: Private sector should be involved for the upkeep and maintenance of the monuments. This has been demonstrated to revive the heritage/monument site for tourists. For example, at the Shaniwar Wade monument near Aurangabad, despite being a notified Archeological Survey of India heritage site, ugly encroachments had mushroomed around it and there was a noticeable slowdown in tourist traffic to the area. MTDC received Rs. 60 *lakhs* grant from corporate houses of Venkateshwara Hatcheries, Bajaj Group, Maharashtra Tourism Development Corporation, Tata Sons and Finolex. The face-lift involved sprucing up the front garden,

general maintenance and setting up a light and sound system.
Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Capacity Building for Service Providers: Capacity building for service providers, such as *dhaba* staff, taxi/coach drivers, training of hotel staff, receptionists, training for helpers (Bed and Breakfast scheme providers).
Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Design and Implementation of Environmental Management System (EMS) in Tourist Destinations/ Hotels/ Resorts: An Environmental Management System (EMS) establishes a process meant to bring about continuous improvement, with process dimension and scope being determined by the company in the light of economic factors and other circumstances. While some environmental performance improvement is expected from adopting a systematic approach, an EMS should be viewed as a tool for the company to systematically achieve and control its own target environmental performance level. Just by implementing and operating an environmental management system will not guarantee, in and of itself, an immediate decline in adverse environmental impacts.
Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism; Guide for Sustainable Tourism Best Practices.

Certification of Eco-tourism Destination For example, the National Ecotourism Accreditation Programme (NEAP) was launched by the Ecotourism Association of Australia in 1996, and is jointly run with the Australian Tour Operators Network. The NEAP arose out of the fundamental problem of how to distinguish between genuine ecotourism operators and other operators, who operate in natural areas.

The Kerala Tourism Development Corporation (KTDC) has introduced an eco-certification scheme as part of its efforts to promote eco-friendly tourism in the State in 2003. The scheme called 'Eco-Kerala', attempts to evolve a set of practices to help each sub-sector with the tourism sector to be more eco-friendly. The scheme involves grading of hotels and resorts based on their compliance with three sets of conditions that have been classified as essential, necessary and desirable.
Source: Integrating Biodiversity into the Tourism Sector/Best Practice Guideline; www.uneptie.org/tourism/bestprac.html.

Apply the "Polluter Pays" Principle: Payment must be equal to the damage done (however, it is important to have in mind that sometimes the environmental damage is irreversible, e.g., if a species goes extinct no payment will compensate for the loss). For instance, in Belize, a departure tax for every foreign visitor leaving the country (presently about US$2.50) has been levied for environmental conservation. The key parks system resources are currently managed by the Belize Audubon Society, which receives no funding from the Government, but rather raises its funds through entrance fees, Protected Areas and Conservation Trust (PACT) taxes, and international donors.
Source: Integrating Biodiversity into the Tourism Sector/Best Practice Guideline. www.uneptie.org/tourism/bestprac.html.

4.1 Potable Water Supply

Potable water supply is the basic necessity in rural areas. In rural areas where open defecation is practiced, pit latrines are provided at the community and household levels for improving sanitation. Besides provision of latrines, also provide the users access to soap, ash and water leading to higher personal hygiene. In case, groundwater is used as a drinking water source, then the following safeguards should be adopted.

- A minimum distance of 15 meters should be kept between latrine and down-stream ground water abstraction point.
- In case of space constraint between the latrine and the water extraction point, water from a lower level in the aquifer should be extracted.
- Where groundwater is shallow, artificial barriers of sand around latrine and pits can control groundwater contamination.

Source: A Guide to Development of on-site Sanitation, World Health Organisation, 1992.

In rural areas, the sources of water should be protected from cattle shed washing by diverting it into a storage pit, which can be used for agriculture.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Water sources, e.g., spring can be protected by constructing a concrete base around it. This will not only protect water from solid waste scattered around it, but will also provide quick collection of water for usage.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Provision of separate drinking water supply for animals has been found to protect the sources of water for human consumption. Diversion of household waste water into grey water pits instead of discharge into backyard or open drain will result in grey water recycling. This grey water can be used for agriculture.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Provision of compost pit for disposal of biodegradable solid waste, which, otherwise, is disposed outside the households in rural areas. This practice has been found to prevent contamination from flies, a major contributor to the spread of diarrhoea. Provision of trash bins at selected places in villages has been found to divert rubbish at one place, thereby contributing to the reduction of diseases.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Provision of Ferro cement tanks for storage of water in rural areas not only provides improved access to water, but also results in improvement of hygiene and reduction of diseases.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Participatory approach has been adopted as part of Slum Improvement Project (SIP) to provide water supply and sanitation facilities in urban areas. This has been achieved based on the contribution of households towards meeting the implementation costs of the project and creation of infrastructure at community household level. Further, the SIP has significantly raised levels of awareness, particularly in health and sanitation, among slum dwellers, resulting in significant reduction in the incidences of numerous water supply and sanitation related diseases. These best practices have been pilot tested in slum areas of Dhaka in Bangladesh and Ahmedabad, Gujarat in India and replicated in other urban centres, too.
Source: www.unhabitat.org/best practices, Best practice for demonstrating Slum Improvement Project in Dhaka Metropolitan City, Bangladesh, Case Study Ahmedabad Slum Networking Programme-India

Before the establishment of common Bio Medical Waste Management facility, deep burial method was practiced for the purpose of disposal. It may not be possible for small nursing homes, dispensaries, clinical laboratories and other small organisations or individual medical professionals to carry out treatment and disposal of biomedical waste generated as per the methods prescribed in the rules and guidelines on their own. Neither it is economical for even bigger hospitals to have their own treatment facilities. A Centralised Bio-Medical Waste Treatment Facility (CBMWTF) has been found to provide an ideal solution to all such problems. In this system, all activities starting from the collection of Bio Medical Waste Management till its treatment in CBMWTF and final disposal is entrusted to the facility operator, who is operating the plant on Build Own Operate Transfer (BOOT) basis. This practice has been adopted by ULBs in India. Treatment technologies specified are incineration and sterilisation (autoclaving) followed by shredding.
Source: www.indiaurbanportal.in

World Health Organisations (WHO) has prepared a document to provide guidance for selecting the most appropriate option for managing solid waste, bio medical waste generated at Primary Health-Care Centres (PHCs) in developing countries. The main tool of this guide consists of six decision-trees

aimed at assisting the user in identifying appropriate waste management methods. The six basic elements include waste minimisation, segregation, codification, handling, transportation, treatment and disposal. The guide takes into consideration the most relevant local conditions, the safety of workers and of the general public as well as of environmental criteria. The decision-making process helps in selecting adequate options for the safe disposal of wastes at PHC level.

Source: Management of solid health-care waste at primary health-care centres – A decision making guide: Immunisation, Vaccines and Biologicals (IVB), Protection of the Human Water, Sanitation and Health (WSH), World Health Organisation, 2005

Buffering Wetlands/Water bodies/reservoirs from Human Pressure and Rejuvenation of Natural Process for their Restoration: Conservation and restoration of wetlands/water bodies/reservoirs involves not only buffering them from direct human pressures, but also maintaining all other important natural processes, which are directly linked to supporting them in maintaining the fragile ecosystem. Measures like controlling soil erosion, reducing pressure on water resources, such as wetlands/water bodies/reservoirs and, most importantly, changing the attitude of people in using wetlands are important for their conservation and restoration. Long term measures include creating buffer zones for wetland/water body/reservoir protection, limiting anthropogenic activities around the wetlands/water bodies/reservoirs and helping in reviving their natural functioning. The restoration programmes with an eco-system approach helps in correcting Point and Non-point sources of pollution. This, along with regulations and planning for wildlife habitat and fishes, helps in arresting the declining water quality and also reduces the loss of wetlands/water bodies/reservoirs.

An integrated approach to manage the wetlands is required where the following conservation measures can be used to restore wetlands/water bodies/reservoirs.

- Adoption of pollution abatement practices to reduce the Non-Point source of pollution through source reduction and waste minimisation.
- Afforestation with native species in areas around the wetlands/water bodies/reservoirs to control the entry of silt from runoff.
- Lining of the shorelines of the lakes with bricks or stones in an attempt to control shoreline erosion.
- Construction of artificial wetlands/water bodies/reservoirs for the purpose of storm water management and pollutant removal from surface water flows.
- Building infiltration trenches for reducing storm water sediment loads to down-stream areas by temporarily storing the runoff.
- Rotation of crops rather than monocultures to reduce the need for Nitrogen and assist with pest control and help in aeration of soil.
- Promoting public education programmes regarding proper use and disposal of agricultural hazardous waste materials and regular monitoring of wetlands/water bodies/reservoirs.
- Promoting recreational facilities and creating public consciousness are essential for prompting people in general to take initiatives in protecting wetlands.
- Rainwater harvesting is one of the key steps to be adopted in urban communities, where most of the area has been metalled either by the roads or by concrete buildings, to improve the groundwater recharge, and thereby reduce the pressure on wetlands/ water bodies/reservoirs to meet the urban water resource demands.
- Along with Rain Water Harvesting, storm water management helps in reducing the pressure on wetlands/water bodies/reservoirs. In urban areas, rainwater is generally diverted to sewerage drain, which makes it expensive to treat and use it for any purpose. Investment can be made to have a separate drain for storm water to which the rainwater harvested in each and every individual unit could be

directed. It will be, then, cost effective to treat and use it for non-potable purposes in industries, gardening or any other non-potable purpose.

- Prevention of silt is better than de-silting or dredging, which involves huge economic costs.
- Waste water, solid and semi solid waste entering into the lake from external sources must be stopped before any restoration work is implemented.

Source: Nanda Kumar, Wetland Conservation in India; need for effective legal framework. http://www.nlsenlw.org/environmental-protection/articles/wetland-conservation-in-india-need-effective legal-framework/sendtoform

Good Practice in Solid Waste Management in Buffer Zone for the Conservation of Lakes/Wetlands: Door to door collection of solid waste from households in buffer zone and direct disposal using composting can assist in the conservation of lakes and wetlands. For instance, the conservation of Naini lake in Nainital, Uttarakhand.

Case Study 1: Naini Lake, Nainital, Uttarakhand

The Naini lake is the sole source of drinking water for Nainital town, an important tourist destination in Uttarakhand State. It is connected to 62 drains out of which 23 directly fall into it. Increasing inflow of tourists and urban waste making its way into the lake has adversely affected its water quality. To conserve this important water body, the residents have switched on to a scientific garbage disposal system – under a project named 'Mission Butterfly' initiated by the Nainital Lake Conservation Project. The sweepers, on a small monthly charge, collect waste from each household and directly transfer it to the compost pits. Apart from the residents, schools and hotel owners have extended full cooperation to the authorities to save its precious eco-system. In addition to helping the authorities in preventing the waste from entering the lake, they are able to generate income and employment by converting it into manure. The schools are also educating their students about waste management.

Source:http://www.mycleanindia.com/states/Uttarakhand/missionbutterfl y.html

Low Cost Sanitation for Rural Population (Stand alone/Community): Low cost sanitation provides solution for safe disposal of human excreta on-site. Flush compost toilet, a recommended on-site solution, is eco-friendly, technically appropriate, socio-culturally acceptable and economically affordable. It is an indigenous technology and the toilet can easily be constructed with the help of local labour and materials. It consists of a pan with a steep slope of 25°-28° and an especially designed trap with 20 mm water seal requiring only 1.5 to 2 litres of water for flushing, thus helping conserve water. Scavengers are not needed to clean the pits. There are two pits of varying sizes and capacity depending on the number of users. The capacity of each pit is normally designed for three years' usage. Both pits are used alternately. When one pit is full, the incoming excreta is diverted into the second pit. In about two years, the sludge gets digested and is almost dry and pathogen free, thus safe for handling as manure. Digested sludge is odourless and is a good manure and soil-conditioner. It can be dug out easily and used for agricultural purposes.

Source: http://www.sulabhinternational.org/st/advantages_sulabh_toilets.php

Legal Intervention to Promote Water Harvesting in Hilly Areas: The State of Arunachal Pradesh is now mandated to adopt water harvesting as a conservation tool in urban areas as part of its reforms action plan committed to the Central Government under the Jawaharlal Nehru National Urban Renewal Mission.

This State is one of the highest recipients of rainfall in the country. Despite this, piped supply to established urban centres, such as Itanagar and Naharlagun are frequently disrupted on account of failure of the distribution system.

Traditionally, ground based recharge systems have also been discouraged as the rate of run-off is very high, and the stability of sub-terrain aquifers on slopes cannot be assured. In view of the same, some simple tools are now being incorporated in the building bye-laws being notified by the State. These include: construction/installation of a surface reservoir fed directly from a gutter channel placed strategically along the roof (all roofs in the State are sloping and the material in use is

painted and/or galvanised iron sheeting). The bye-laws exempt such surface reservoirs (up to 1,000 liters) from Floor Area Ratio; households/establishments with active rain-fed surface water reservoirs to be provided with steady exemption in tariff on piped water supply. There is still some debate on whether flat rate should be used or a metered supply is workable; an active set of bye-laws for re-use of recycled water for non-potable purposes, such as arboriculture/horticulture. Unlike areas with sewerage systems, the cities of Itanagar and Naharlagun generate considerable surplus water from rain water run-off from public areas, which goes into one of the several drainage channels (artificial/natural) in the city. The bye-laws and zoning regulations provide for creation of isolation and settlement ponds from where such water can be pumped for non-potable use.

Promoting roof-top rainwater harvesting can reduce water storage in hilly areas. An NGO called Pan Himalayan Grassroots Development Foundation has popularised the construction of concrete underground tanks for roof-top rainwater harvesting. The initial capital cost of storage tank constructions, along with gutter and down pipes, is roughly Rs. 2/ltr.(Rs. Two Per Litre) of storage. For this purpose, the organisation has trained a cadre of local barefoot technicians to undertake masonry, plumbing and other works. This team is organised in a team called the Kumaon Artisans' Guild. Members of this guild have been responsible for providing critical training i nputs to various communities in the States of Uttarakhand and Himachal Pradesh in the construction and maintenance of rainwater harvesting structures.

The Guild has also acquired participatory management skills including accounting and has accepted the principles of social audit. The creation of such guilds is of great importance for the success of appropriate technology transfer at the community level. The other appropriate technology based on traditional knowledge, which entails harvesting of rainwater for groundwater recharge being tried out in Uttarakhand is that of digging trenches (*Khaals*) and erecting small check dams (*bandhs*). These khaals and bandhs are placed along the mountain slopes to catch the flowing surface water and to enhance infiltration and moisture retention in the soil.

Himachal Pradesh Government has made it mandatory (letter no. PBW (B&R) (B) 24 (1) 91-1, Dated 07/07/1999 to make Rain Water Harvesting structures in all buildings. The Town and Country Planning Department has issued instructions to all functionaries including map approving agencies that no building plan may be approved without making provision for rain water harvesting structure, which will be @ 20L per sqm of roof-top area.
Source: Promoting Rainwater Harvesting Structures in Hilly Terrain; Environment Water Community; www.indiawaterportal.org/TCPO, Government of Himachal Pradesh

Privatising the operation and maintenance of Urban Water Supply: The Public Health Engineering Department in Ajmer has privatised the operation and maintenance of the filtration plant, pipelines and pumping stations of the water supply scheme from Bisalpur Dam i.e. Gobind Sagar Dam. This has reduced labor management problems; time taken for repairs and the operation and maintenance cost for the Public Health Engineering Department. Consumers also benefit from a better maintained and reliable drinking water service. Given the advantages to various stakeholder groups, it is clearly one way to improve urban water supply.
Source: Cost-effective & financially sustainable urban water supply & sanitation services/from International Water Management Institute, Gujarat/Comparative experiences; Water and Environmental Sanitation Network (WES-Net India); Environment Water Community; www.indiawaterportal.org.

Initiatives of the Nagpur Municipal Corporation (NMC) for Reducing Water Losses due to Illegal and Un-metered Water Connection: The problem faced by the NMC was huge losses in distribution due to illegal and un-metered water connections, which also caused acute water shortage. In late 2001, NMC initiated a programme for regularising illegal water connections and

applying metering policy. For identifying unauthorised and un-metered connections, licensed plumbers were involved in the programme. The incentive of Rs 50-100 for every illegal connection motivated about 200 plumbers, who were organised into teams and assigned to the seven water zones for convincing the illegal connection holders to regularise their connections; getting the connections sanctioned; fixing meters; and reporting those, who refused to regularizes, to the respective zonal office. The water connections of those, who refused to avail the scheme, were immediately disconnected. The NMC staff working on the team was also motivated by a fixed monthly target of revenue collection from respective zones. With insignificant expenses of about Rs. 0.2 million as incentives for plumbers and a minimum amount spent on publicity drive, the programme achieved regularisation of about 25,000 (71%) connections within a short period of four months. There was significant and evident increase in revenue generation as the quantity of water billed translated into over three-fold increase in revenue from Rs. 148.3 million in 1998-99 to Rs 500 million in 2001-02.

Source: Cost-effective & financially sustainable urban water supply & sanitation services/from IWMI, Gujarat/Comparative experiences; Water and Environmental Sanitation Network (WES-Net India); Environment Water Community.

Recycling of Sewage Water Prevents Groundwater Depletion, e.g., National Security Guard (NSG) Manesar Campus Recycles Sewage Water, Haryana: A sewage treatment plant operates 2-3 hours/day, treating the sewage with Effective Microorganisms bacteria. Results indicate that the water's high nutrient content nourishes plants, and reduces Suspended Particulate Matter in the air.

Source: Roof water harvesting in urban areas for groundwater recharge, from ICEF; Water and Environmental Sanitation Network (WES-Net India); Environment Water Community.

Multiple Options through Gravity Flow System (GFS) Managed by VWSCs, Nainital: In 1997, *Swajal* supported scheme offered multiple options- Roof Top Rain Water Harvesting tanks and community water supply system through GFS. The scheme still functions well mainly due to active Village Water and Sanitation Committee ensuring efficient Operation & Maintenance, community participation and procurement system along with community contribution. However, the *UPJAL Nigam* did not undertake purchase, quality control and the Village Water and Sanitation Committee (VWSC) did the same ensuring quality of structures till date.

Source: Decentralised Models for Providing Safe Drinking Water in Rural Areas; Environment Water Community; www.indiawaterportal.org.

Micro Watershed Management Demonstration in Kerala: In Erimayoor, Eruthempathy and Vadakarappathy *Panchayats* in Palakkad district, National Healthcare Groups (NHGs) formulated micro projects in water resource management and presented them in the *Gram Sabha*. These were included in the *Panchayat* Plan and NHGs implemented the projects. There were also awareness programmes for the community and school students on conservation and natural resource management. At the school level, they formed a water club. A local long-term perspective plan for water management is being developed. The *Panchayat* Resource Centre, which has facilities to monitor climate, rainfall, water situation also functions at the *Panchayat* office. They have also conducted water balance studies at the *Panchayat* level. This was facilitated by an NGO called Maithri for these *Panchayats*. Another initiative is by SEWA and Vilappil *Panchayat* in Trivandrum district to evolve sustainable development norms where water, soil and energy form the major components. This is achieved by establishing mutual relation and cooperation for conservation of water. The discussions and decisions are arrived at in the NHGs, *Gram Sabhas* and the *Panchayat* Committees. Water literacy has been their main plank. Both this initiatives were supported by SDC-CapDecK.

Source: Improving water and sanitation governance by PRIs, from SEUF, Kerala; Environment Water Community; www.indiawaterportal.org.

Decentralised Rural Water Governance and Women's Empowerment in

Maharashtra and Gujarat: Decentralised rural water governance and women's empowerment has led to successful water quality control and management in rural areas. Women are proactive in drinking water governance in rural areas if they are part of existing power structures, such as Self-Help Groups (SHGs). A powerful external agency, an NGO or a Community Based Organisation can put women at the helm. However, merely legislating a quota for women in village water and sanitation committees fails to involve them in this critical area. The local SHGs, *mahila mandals* or NGOs can catalyse the role of women in drinking water governance.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community; www.indiawaterportal.org.

Decentralised Rural Water Governance and Women's Empowerment In Kerala: Women are responsible for collecting water for domestic use under the *Jalanidhi* programme. The law prescribes that one third of the Water Supply Beneficiary Group members be women. Women undergo training so that they can plan and execute drinking water schemes. They had led agitations against the local administration, when the latter failed to provide enough water. This model shows that women are better in collecting and managing funds for water schemes as well as in administrative matters. They are also good at holding the Government accountable.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community; www.indiawaterportal.org.

Technical Skill Building Leads to Women's Participation in Water Governance: The Gujarat Water Supply and Sanitation Board (GWSSB) invited SEWA to restore the failing water supply systems in Gujarat. As part of this, SEWA trained over 2500 women to repair hand pumps, who were also provided a small fee and vehicle expenses to travel to villages with their tools. Through this initiative, women engaged themselves in income-generation. This also contributed to women's decision-making and participation in local water management.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community; www.indiawaterportal.org.

Women Recycle Water to Deal with Water Shortages, Narnaul, Haryana: Nai Basti in Narnaul has been struggling with water shortages. To deal with the problem, women here recycle water and put it to multiple uses. The water from washing clothes, for instance, is reused to wash dishes. Water that cannot be used again is, then, used to flush the drains outside their homes. Nai Basti also has no sewerage. However, due to the initiative of these women, the area is surprisingly clean, and water is also being conserved as a result of their efforts.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community.

Women's Participation Ensures Better Water Distribution and Maintenance, Raisen District, Madhya Pradesh: In Kamapar village, Madhya Pradesh Water User Associations involving women were formed to deal with drinking water supply issues. These were linked to SHGs, NGOs and *Mahila Mandals*. The SHGs lent money to the Water User Associations for canal restoration work. As a result of these initiatives, women's participation in water supply schemes was enhanced. Their consent also became an imperative in water distribution management.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community; www.indiawaterportal.org.

Samana Federation Led by Women Help in Tank Restoration and Water Supply, Pondicherry: The Pondicherry coastal region has been excessively mined for groundwater and the groundwater quality here has been deteriorating progressively. The Samam Federation, led by women, has ensured that the overhead tanks in their villages are cleaned on a regular basis. This has not only ensured the availability of drinking water, but also its quality. This effort has also resulted in financial savings, as it has prevented water borne diseases.

Source: Rural Drinking Water Governance and the Role of Women; Environment Water Community; www.indiawaterportal.org.

Case Study 2: Payment for Environmental Services – an approach to enhance water storage capacity as well as to carry out other development plans

Payment for environmental services (PES) is an emerging paradigm in the management of environmental resources. Rather than Governments relying on regulatory instruments, such as prohibitions and standards, PES relies on adopting innovative mechanisms that are tied to incentives, and are flexible, voluntary, and contextualise the socioeconomic reality. The basic rationale of PES is to provide incentives and benefits to people agreeing to utilise ecosystems in ways that protect or enhance their environmental services for the benefit of the wider population.

PES for water storage: This case study examines the use of PES as a policy instrument in the Kulekhani watershed in central Nepal, and how it has played a role in enhancing the capacity of water storage.

Kulekhani hydropower (Nepal): The Kulekhani watershed is located 50 km southwest of Kathmandu and is the source of water for the Kulekhani reservoir, which supplies water to hydropower plants downstream. The 92 MW Kulekhani hydropower plant is different from most hydropower plants in Nepal in that it relies entirely on monsoon rain collected in a reservoir rather than on rivers emerging from the Himalayas. As with similar reservoir systems, the plant was designed to supplement peak load in the drier seasons.

In 1973, Nepal generated 39 MW of electricity of which 32 MW came from run-of-the-river (RoR) systems (Ghimere 2004). At this time, the demand for electricity was increasing by around four percent per year. The generating capacity of the RoR plants was nearly one-third less in the dry season. In 1980, the peak load requirement was 65 MW, indicating a need for an additional 40 to 60 MW by the mid 1980s. The 92 MW Kulekhani hydropower plant was commissioned by the Nepal Electricity Authority in 1982. The original gross capacity of the reservoir was 85.3 million cu.m of which 73.3 million cu.m was live volume. The reservoir, designed with a life-span of 50 years, was expected to last 100 years (Sthapit, 1996). However, the main problem for reservoir type hydropower plants in Nepal is sedimentation. Sediment loads in Nepal's watersheds are among the highest in the world; 85 percent of the runoff occurs during the monsoon yielding 98 percent of the sedimentation load (Mahmood, 1987 in Sangroula, 2006).

The Kulekhani watershed: The hydropower reservoir depends on water from a 12,500 ha watershed with a mosaic of different land uses (Table). The watershed has 8000 households with over 45,000 residents, spread over 8 VDCs living in a subsistence economy based on (sloping land) agriculture and livestock rearing. Communities also manage forests to extract timber, fuel wood, fodder, and litter. The four monsoon months account for around 80 percent of the annual precipitation; this rain is the main source of water for agriculture. In general, there is a shortage of water during the remaining eight months.

Land use in the Kulekhani Watershed in 1991

Land use category	Area (ha)	%
Sloping terrace	4254	34.0%
Level terrace	237	1.9%
Valley terrace/fans/tars	713	5.7%
Forest	5455	43.6%
Shrubland	1147	9.2%
Grazing and grassland	200	1.6%
Barren land/rock	50	0.4%
Lakes	216	1.7%
Gullies/landslides	18	0.1%
Other	210	1.7%
Total	12,500	100%

Source: IWMP, 1992 in Sthapit, 1996

The Kulekhani watershed receives 1500 to 1700 mm of rainfall annually on an average, but the rainfall is often uneven. In July 1993, the watershed received 542 mm over a 24-hour period with rainfall reaching 80 mm in an hour, causing a massive landslide, flooding, and siltation. The plant required major repairs. Over its 20 years period of operation, the reservoir has lost more than 25 percent of its storage capacity due to siltation (Sangroula 2006).

The PES mechanism: With the rapid loss in capacity of the reservoir, the Government recognised that Kulekhani was a critical watershed of strategic importance and started programmes targeted at participatory conservation. More attention was paid to promoting proper land use management in the uplands to reduce siltation. Activities to promote watershed

conservation included community forestry, conservation education, terrace improvement, and fruit plantations.

Various studies (e.g., Amatya, 2004; Ghimere, 2004) have shown that soil erosion from agricultural land is as much as 73 times higher than that from forested land. Analysis of landuse patterns showed that forest cover in the watershed declined between 1978 and 1992, but it had recovered to earlier levels by 2001. An analysis of sedimentation patterns indicated that the rate of sedimentation in the Kulekhani Reservoir declined with the increase in forest cover and the dry season water f ow gradually increased (Upadhyaya, 2005). Maintaining forest cover appeared to be an eff cient way of reducing siltation. In 2003, in line with this, the Rewarding the Upland Poor for Environmental Services (RUPES) programme (WAC, no date) started to work with upland communities in Kulekhani and the hydropower plant authorities to foster a win-win situation based on a PES mechanism (Upadhyaya, 2005). The RUPES programme empowered local communities and organised them into a Watershed Conservation and Development Forum to promote the conservation of forested lands in the upland watershed to reduce siltation. The aim was for the electricity authority to f nance the activities through a PES mechanism with the upland people living in the catchment area receiving a payment from the hydropower plant in return for the community managed forests they conserved.

RUPES was successful in establishing a payment mechanism channelled through the District Development Committee (DDC) based on the 1999 Local Self-Governance Act and the 1992 Decentralisation Act. The Nepal Electricity Authority pays the upland farmers for implementing the conservation activities via the Central Government, which allocates 12 percent of the royalties generated from the Kulehkani plant to Makwanpur DDC under the Environment Management Special Fund. Of this, 50 percent is allocated to the village development committees (VDCs) in Makwanpur District and the remainder to upland settlements (20 percent), down-stream settlements (15 percent), and the VDCs that house the power plant, generator, dam, and reservoir (15 percent).

The Kulekhani case ref ects the start of a paradigm shift in Nepal with the Government taking action to introduce PES. So far, three annual payments have been made. The VDCs, together with other local bodies, such as civil society groups, political parties, and NGOs, organise themselves to formulate a plan, which is discussed at village level meetings and then presented to the DDC for f nancing approval according to the agreed allocation. The budget is in addition to the regular VDC budget and depends on the power generated from the plant. So far, much of the payment has been used by the local population for rural development work of immediate benef t, such as village electrif cation and road construction.

Source: Bhaskar Singh Karky, Sustainable Livelihoods and Poverty Reduction, ICIMOD, bkarky@icimo d.org Laxman Joshi, ICRAF SE-Asia Regional Research Programme, L.JOSHI@CGIAR.ORG; Sustainable Mountain Development No. 56, ICIMOD, Winter 2009.

Community Based Water Harvesting Systems and Gender Equity – Experiences: Equity of access for women is one of the guiding principles of Integrated Water Resources Management (IWRM) for community development. Conventional approaches to water resources planning have ignored the female half of the population. At best, they assign women passive roles in programmes designed and executed by men. On evaluation, they are found to be wanting, as they do often fail to 'reduce the drudgery of women' regarding collection of water for domestic use. Women's leadership in water supply projects has gained ground fairly recently. There are ample examples where, given leadership in managing this vital resource, women so empowered have claimed a substantial space in the larger social life of their communities. NGOs have successfully trained women to design, execute and manage water resource projects; they have brought in more than an element of equity in women's lives. Women, who have been part of these projects, have more say and respect in communal life as well.

Equity for Women in Land and Water Management Ensured through Land Rights in Rajasthan: In order to deal with water shortages, Oxfam provided women with resources to construct water tanks on the condition that they would be entitled to the land around it. As a result, women developed the land into horticulture patches. This significantly added to family incomes and ensured their visibility as innovators and horticulturalists. It also ensured women's equity in decision-making with regard to land and water management.

Restoring Watershed Structures Ensures Women as Equal Contributors to Village Governance and Water Management, Pali District, Rajasthan: A group of women in Pali constructed watershed development structures to address the water crisis in the area. Through this process, they asserted their roles in water management and raised water priorities in the village development agenda. They were also able to negotiate the interests of vulnerable castes regarding access to water. This effort made them equal contributors in village governance and water management projects.

Source: Community-based Water Harvesting Systems and Gender Equity - Experience; Environment Water Community; www.indiawaterportal.org.

Case Study 3: Revival of ancient water system of Chitradurga city through rainwater harvesting – a success story

Rainwater harvesting is an ancient technique that is enjoying a big revival in popularity around the world because of its

inherent qualities. Archeological evidence supports the capture of rainwater as far back as 4000 years ago and ruins of cisterns built as early as 2000 BC are still standing in Israel. Rainwater has a culture; it is attractive to our senses and, to some, it is sacred. It is called sky supply, water from heaven, and nature's watering agent.

Situation prior to the initiative: Water in Chitradurga City was the most sensitive issue for the last five years. This district has faced 59 droughts in 100 years. Due to regular drought situations, the underground water has suffered severe stress. In addition to this, the grand neglect of the traditional water bodies has also resulted in fast depletion of underground water. Many of the ancient Water Vessels (*Kalyanis*), which were used as garbage and debri pits, were automatically converted as mosquito breeding and epidemics spreading centers.

Strategies adopted and implementation process:
Intervention 1: Awareness Programmes: Several workshops were held at various places of Chitradurga to educate the people about Rain Water Harvesting. During the workshop, posters and pamphlets in local language were distributed to people for better understanding. On every specified day, people used to gather for interaction at predetermined convention centers to discuss the problems of water. It helped them to plan effectively the programme of Rain Water Harvesting.

Intervention 2: Identification of catchment areas: The catchment areas were determined based on the natural inter-connected *nullas* with the help of local hydro-geologists and water resource experts. Residents from neighboring localities of the water bodies of Chitradurga have played an important role in identifying and removing the encroachment of natural water ways (Drainage pattern). The officials of various departments along with the local MLA also took immense responsibility in creating awareness on importance of water pockets and significance of rainwater harvesting.

Situation after implementation of Initiative: It was found that this water body (Channakeshavaswamy *Honda*) was a great source of water in this area. Nearly 52 bore wells, which were yielding brackish (saline) water, are now yielding sweet water. As the number of houses surrounding this *Kalyani* and the catchment area diminished due to the clearance of encroachment, the District Administration, along with City Municipality, took the initiative to divert the roof rainwater through a pipeline from Urban Development Authority Office and the premises of All India Radio, which were located at a higher gradient of this *Kalyani*. Consequently, this *Kalyani* got filled several times and the water just vanished (percolated) underground. Gradually, this small initiative resulted in keeping the level of water in all the bore wells around this *Kalyani* constantly at 50 to 70 ft.

With replenishing of water bodies (*Kalyanis*, *Hondas*, Ponds etc.), the dried bore wells in the vicinity have been yielding excellent water, both in quality and quantity. The City Municipality, along with District Administration, has cleaned up nearly six big Kalyanis to hold maximum amount of water and the scarcity of water was never felt during the summer seasons of 2005-06, 2006-07 and 2007-08.

The revival of the ancient water bodies has paid rich dividends, as the city, which was reeling under water scarcity, has become a city of water plenty. The people are very happy to follow the suit. The Government is also encouraging this type of initiative.

This initiative is easily replicable in other parts of the State/Country where similar nature of water bodies prevail. Beside this, the Rooftop Rainwater Harvesting techniques can be disseminated and practiced throughout the areas where the rainfall is below normal and the problem of water scarcity arises in lean period of the year (summer). This could be achieved in vulnerable urban local body (Municipality) with proper coordination among local community, concerned Government Departments, elected representatives and the NGOs.
Source: Revival of ancient water system of Chitradurga city through rainwater harvesting – a success story; A Guidebook for Local Catchment Management in Cities; UN-HABITAT.

Case Study 4: Efficient revenue billing and collection system can improve the financial health of utility

Situation Prior to the Initiative: Before computerising the Revenue Billing activity, manually written bills were issued. These bills were not giving a clear picture about the consumption and other details to the consumers. Most of the time, the percentage of bill accuracy was very less. Manual ledgers were maintained by ledger clerks. As said, 'to err is human', errors were dominating the ledger details. The MIS reports, which were required to improve the overall efficiency, were not available. In the manual system, the meter reader visited the customer households, noted down the current meter reading and gave the details to the concerned dealing assistant, who calculated the consumption and arrived at the amount to be paid by the customer as per the consumption. In this process, there is every possibility that human errors would be committed by the meter reader while calculating the water consumption and preparing the bill by applying various kinds of tariffs and customer types. For every 400 customers, one ledger was maintained wherein details of consumption, bill raised, amount realised, balance, etc. were recorded for each of the customers in their respective ledger folio. The customers had to visit their respective sub divisional cash counter centers located at BWSSB service station or sub divisional office for payment. These counters were open for four hours only during office hours. The payment details were updated in the customers' concerned ledger folio by the dealing assistant. For any information requested by the customer from the BWSSB, the ledger had to be referred to for details. Similarly, for the top management of the Board, the information had to be manually compiled sub-division wise by referring to the

ledgers, which was a time consuming process. This may also lead to error in the final statement, like the Demand Collection Balance. Moreover, the top management could not review some of the cases, like house locked, meter damaged, abnormal or subnormal consumption, faulty meters, arrears, etc. Large number of manpower had to be deployed for processing the bills and updating the ledgers. Further, the ledger folio, meter reading, etc. were not tamper proof; and errors in reconciliation of bills paid and delay in money deposited in the bank were other issues. The citizens had to make several visits to the office for getting new water and sewage connection. There was no mechanism to verify whether the grievances of the citizens were addressed by the concerned officials. The management did not have access to the number of customers, category-wise in each sub divisions. Also, consumption details, pumped details and loss of water could not be calculated.

Intervention: Information Technology (IT) and Geological Information System (GIS) enabled interventions were introduced with computerisation of Revenue Billing and Collection Process, so that citizens should get error free bills and should be able to pay their bills at their convenient time and place. The complete billing process needed to be transparent, so that citizens should get services from the respective sub divisions without any hassles. Further, top management should be able to get accurate demand collection and balance, and monitoring of cases, like door locked, meter damaged, meter not working, abnormal and sub normal consumption, etc. should be made easier.

Strategies Adopted and Implementation Process: For this, the National Informatics Center had to study the manual system, existing sub divisional level computerisation and the requirements of BWSSB. The existing procedure of generation of bills at Sub Divisional office had to continue, so that the concerned Sub Divisional Staff can own the operations. With the existing technology and resources, it was decided that citizens could pay their bills ANY WHERE ANY TIME instead of standing in long queues at their respective Sub Divisional cash counters. Complete billing process, ledger maintenance, etc. should be transparent. For this, primary and secondary servers were installed with five client systems at each of the 26 sub divisional offices. All the sub divisional offices, divisional offices and head office were networked though leased line; and 74 Cash Collection KIOSKs (ATMs) were installed at existing cash counters and also at strategic locations, convenient for the citizens of Bangalore, to pay their water and sewerage bills. Citizens could also opt for payment of their water bill through Electronic Clearance Scheme (ECS) facility. The BangaloreOne data center is connected to the BWSSB Head Office through leased line, so that the citizens can pay their bills in any of the BangaloreOne centers. The complete billing and collection process is handled by the BWSSB employees. The software was designed and developed by NIC and audited by a third party. Any change in the customer details, like commercial/domestic connection, bore size, meter reading, write off, etc. is done through Bio-metric authentication. Audit trial is enabled so that each and every crucial transaction is recorded. Access to the BGS application is through user login and password; and the bill should be Barcoded, so that the details cannot be tampered and spot billing could be implemented.

The citizens are the primary stakeholders in any equation of governance, and it is their right to expect service from public servants. BGS strives beyond public expectation in setting the standards of service. Pre-fixed reading days for meter readers and monitoring the abnormal, subnormal consumption, Issuing of bill showing detailed demand and previous month collection details are a few unique services offered by the BGS System. Different levels of security is maintained in the system - the bill is secured by BARCODE; cash counter information are encoded with MAC address of the system. Biometric authentication is implemented for major operations and audit trailing is enabled for major events. The collection centres of BGS include 74 KIOSKS accepting cash/cheque, Bangalore One, cash counters attached to each subdivision and ECS clearance system. The collection data is captured at the above centres through the BARCODE reader and transmitted to the Head office. From Head office, the data is posted to the respective subdivisions through SQL replication. 'ANY WHERE ANY TIME PAYMENT' is an additional facility provided to the citizens. The system manages the collection facility through SQL Merge Replication technology, which runs 24X7. Single bill with multiple payment and multiple bills with single payment are also accepted in these centres. With all these facilities, there has been a sustained increase in collection and the system is helping customers and the Department. After seeing the success, the Department has integrated workflow based New Water Connection Module and SPOT Billing services, which give openness and transparency in billing and ensure speedier and fool proof working of the Department. Facility is provided for the customers to lodge their grievances through BWSSB website and IVRS system.

Situation after Implementation of Initiative: The complete billing and collection process is transparent. Citizens are happy to pay ANY WHERE ANY TIME from the nearest KIOSK instead of cash counters, which were in operation for four hours only. Citizens are able to pay the bill as and when they find time and at convenient locations. For example, when citizens go for morning or evening walk or to the BDA shopping complex, etc., they can pay the bills since the Cash KIOSK is operational 24X7. Now, citizens pay at their convenient time instead of waiting till the due date. This has benefited the Board by reducing the credit time (interest to be paid to the bank). Each of the BWSSB staff's task related responsibilities are well defined. Biometric authentication for vital processes has made the data secure; and revenue has increased substantially. New water connections to the citizens are provided through the workflow model. The databank was made with proper validations and auditing; Security in bills and receipts are introduced by BARCODE, which has improved the efficiency of BWSSB and achieved strong customer relations; SPOT Billing has reduced the amount of travelling undertaken by the meter reader to a single trip and has also brought about openness in the process. The demand collection balance can be obtained at any time. During Water *Adalat*, any issue with respect to error in bills can be corrected in the systems through biometric authentication. A similar process is adopted for resolving any issue pertaining to water supply or sanitation, etc. for which actions are initiated, so that the citizens are not deprived of water, which is basic and essential for mankind. Complaints are received through IVRS and attended by the concerned AEE and the same is updated. Citizens can query about the status of the complaint by inputting the complaint number through IVRS and know its status. The operation costs of revenue billing and collection has reduced too.

Sustainability and Potential for Replication: It is important that BGS is designed in a financially, legally, and technologically sustainable manner. NIC is the technology partner, consultant, developer and implementer of BWSSB projects. Software was developed using Microsoft based Visual Basic and SQL Server 2000/2005 with Barcode and Biometric technology. All the core business logic/procedures are written as database level procedures. The core BGS systems were given to a reputed third party for testing their functionality and security. The Board has recruited four Technical Engineers and two temporary staff specialised in Software to support

the smooth implementation of the project under the guidance of NIC. NIC has given training to all subdivision staff at the operator, supervisory and officer levels. Since BGS is a citizen centric application and water distribution, billing and collection is core business of BWSSB, NIC has placed a team at BWSSB head office to address critical issues and enhancement of the application.

The Revenue Billing and Collection Software can be replicated in other Water Boards, Urban Local Bodies, and Municipalities etc . After observing its success and sustainability, the Software was also implemented at Mandya District in Karnataka. Further, the software was also implemented at five demonstration zones at Belgaum, Dharwad and Gulbarga districts in Karnataka.

Source: Case Study: Bangalore Water Supply and Sewerage Board efficient revenue billing and collection system can improve the financial health of utility; A Guidebook for Local Catchment Management in Cities; UN-HABITAT.

Integrated Water Resources Management in Singapore: Singapore has taken significant steps towards integrated water resources management. Being a small island State, Singapore has limited fresh water resources. With annual renewable surface water resources of 0.6 cubic kilometres and negligible groundwater, it is in the lowest band of water scarce countries in the world (UN World Water Development Report, 2003). Singapore imports water from Johar, Malaysia to supplement the local water resources. To optimise water supply, about half of Singapore's total land area is set as ideal water catchment.

Although the local catchment water and imported water are adequate for its needs, Singapore has leveraged on new technologies by developing alternative sources of water in reclaimed wastewater (NEWater) and desalinated water to diversify its water resources. The entire population in Singapore is served with potable water, drinkable from the taps and the water is treated to a quality well within the World Health Organisation's guidelines for drinking water quality. The management and control of water resources is essentially the responsibility of the two statutory bodies under the Ministry of Environment. The Public Utilities Board (PUB) is responsible for managing Singapore's water, sewerage and drainage services. It manages, in an integrated manner, all the water resources, such as reservoirs, water works, rivers, drainage system, water reclamation plants and sewerage system. The National Environmental Agency (NEA) is responsible for ensuring that the environmental concerns are incorporated in land use planning, development and building control of new development, and control of water pollution, hazardous substances and toxic chemicals. Singapore has adopted a two-pronged approach to manage its water supply through addition of the available water resources and greater emphasis on control of demand. New projects are in the pipe line to increase the catchment areas to two-thirds by tapping run-offs from urbanised catchments. With the advancement of technology, desalinisation of seawater has now become a viable source of water supply. In 2002, the Public Utilities Board awarded a contract for supply of 136,000 cubic metres of desalinated water per day through a Design-Build-Own-Operate (DBOO) project. A two-pronged approach has also been adopted for demand management of water through implementation of water conservation measures and efficient distribution system. As a result of such initiatives, it has been possible to maintain the per capita domestic consumption of water at 165 litres per day for the past five years and reduce the unaccounted water loss from about 10 percent in 1990s to around five percent in 2002, which is amongst the lowest in the world. The case study shows that there is a need to address the following known weaknesses of collaborative catchment management and devise ways of overcoming them by: developing mechanisms of coordination between and within Government institutions and communities; developing a shared or common vision for the catchment; creating a better understanding of the need for an integrated approach to water resources management; overcoming institutional barriers to effective integration; developing workable methods for coordination and collaboration; helping community catchment management groups mature; integrating economic development with ecosystem management; developing effective communication channels among them; Developing an integrated information management system to support catchment management; agreeing on methods

of conflict resolution to be used in case of disputes among them; and agreeing on how to share the costs.

Regulation of Water Abstraction in the Catchment can Reduce Water Losses and Ensure Water Availability: The ecosystem should be considered as an important user of water. Excessive abstraction of surface water may significantly reduce the flow of the streams or rivers, thus, raising the concentration of pollutants in the water and reducing the capacity of the river to assimilate the pollutants. Overexploitation of groundwater resources may result in saline intrusion in the productive aquifers, making the water unsuitable for domestic use or crop irrigation. A water abstraction and permit database should be established and updated on a regular basis. The database should be used by the managers for guidance in allocating water to users, so that minimum water flow can be maintained.

Activities: To effectively regulate water abstraction in the catchment, the following actions need to be undertaken: determine the available surface and groundwater resources in the catchment; determine the current levels of surface and groundwater abstraction in the catchment; determine the minimum or ecological reserve flow that should be maintained in the rivers; ensure that the catchment's water allocation guidelines to water users including the environment are adhered to; build sufficient institutional capacity in the water sector to monitor compliance to regulations by the water users, especially processing industries and irrigation agriculture that require large volumes of water; water permits should be issued to regulate ground and surface water abstraction by major water users, such as industries and farms, which are not connected to the city's water supply system.

The water sector should issue regulations specifying: volume of water abstractions for which a permit is not needed; volume of water abstractions for which a permit is needed; and conditions under which abstractions of specific waters is forbidden or limited, e.g., during drought periods.

A Catchment Information Management System can Ensure Efficient and Effective Water Planning: In place of the traditional catalogues, an electronic system capable of arranging, storing and exchanging data and information should be installed. An inventory of the natural resources of the catchment area should be prepared using a Geographical Information System (GIS) format. This system will enable the catchment managers to view and locate patterns of settlement, land use and natural resources in the catchment and to identify relationships between the data. The catchment manager can also view land systems, settlement features, land ownership and planning zones, demographic information and other socio-economic data and best management options. The GIS can also be used to study the relationships between pollution, land use, drainage patterns and socio-economic parameters. This involves integration of data under various themes to derive desired analysis and conclusions (Opiyo-Aketch and Kibe, 2000). Using the GIS system, the manager can think of various scenarios and view the changes in land use or environmental conditions over time. This electronic system will also enable the manager to closely monitor the progress in the implementation of the Integrated Water Resource Management strategy.

Source: Integrated Water Resources Management in Singapore; A Guidebook for Local Catchment Management in Cities; UN-HABITAT.

4.2 Sewage

In rural areas, where open defecation is practiced, pit latrines are provided at community and household levels for improving sanitation. Besides the provision of latrines, also provide the users access to soap, ash and water leading to higher personal hygiene. In case, groundwater is used as a drinking water source, then the following safeguards should be adopted.

- A minimum distance of 15 meters should be kept between latrine and down-stream groundwater abstraction point.

- In case of space constraint between the latrine and the water extraction point, water from a lower level in the aquifer should be extracted.
- Where groundwater is shallow, artificial barriers of sand around latrine and pits can control groundwater contamination.

Source: A Guide to Development of on-site Sanitation, World Health Organisation, 1992.

Specific Good Management Practice for Proper Planning and Implementation of Sewage Projects: Specific good management practices have been identified for pipeline projects and include good practices for route selection, watercourse crossing, construction, backfill and final cleanup, natural and assisted recovery, stakeholder environment and specific project components.

Right of Way (ROW) Planning: ROW planning is one of the primary tools that should be used by operators to minimise impacts of pipeline projects in native environments.

Route Selection: Once the general route has been defined and the project manager is informed of the bio-physical constraints within the project area, the route can be adjusted to minimise the impact to the native environment using the good management practices that include: use existing ROWs, access roads or other previous disturbances where possible; avoid unstable terrain. Unstable terrain encountered in river valleys can increase pipeline construction costs and, if not properly addressed, can lead to pipeline integrity problem; avoid sensitive habitat features for wildlife. Adjusting the ROW location to maintain the setback requirements for identified habitat features; identify and avoid soil units that are difficult to reclaim by consulting baseline soil maps and conducting soil surveys; identify plant communities and rare plants to help project planners make informed decisions on soil handling, reclamation and revegetation techniques.

Watercourse Crossings: Good management practices include: use horizontal directional drilling technology where technically feasible. Avoid impact to the riparian zone where possible; reduce the grading requirements where possible. Implement a storm water management plan during construction; restore the riparian zone when it cannot be avoided and where open cut techniques have been used. Where appropriate, employ 'soil bio-engineering techniques' (live staking, brush layering etc.). Ensure that procedures implemented during construction do not inhibit growth and encroachment of the native vegetation.

Erosion Control: Design slopes aimed at the prevention of soil erosion, efficient storm water control, the eventual reestablishment of vegetation and ultimately achieving aesthetically acceptable landscapes:

- Plan for cut and fill slopes not exceeding a gradient of 1(V):3(H) wherever possible.
- In general, slopes steeper than 1(V):3(H) or slopes where the soils are by nature dispersive or sandy, must be stabilised. One or more of the following methods are approved as industry norms in various situations:
  - A 50:50 by volume rock: topsoil mix, 200mm thick, plus grass seed mixture.
  - Logging or stepping (logs placed in continuous lines following the contours).
  - Earth or rock-pack cut-off berms.
  - Benches (sand bags).
  - Packed branches.
  - Ripping and/or scarifying along the contours.
  - Storm water berms.
- Near vertical slopes of 1(V):1(H) or 1(V):2(H) must be stabilised using hard structures, preferably with a natural look and with facilities allowing for plant growth. One or more of the following methods are approved as industry norms in various situations:
  - Retaining walls (loffel or otherwise).
  - Stone pitching.
  - Gabions.

- Shotcrete.
- Sandbags.
- Plastic liners and/or coarse rock (undersize rip-rap).
- Stone pitch the outfalls of all grassed waterways and sub-surface drains.
- Landscape features are often effective mechanisms for water management, retention and dissipation. Investigate the softer option before opting for a civil solution.

Instability of soil: A site on a side-hill can facilitate gravity flow that will reduce pumping requirements and locate normal sequence of units without excessive excavation or fill. When landscaping is utilised, it should reflect the character of the surrounding area. Site development should not alter existing naturally stabilised site contours and drainage as little as possible.

First steps shall be taken towards preventing over-saturation of soil cover forming the hill slopes, particularly in the immediate vicinity around different structures proposed to be constructed at different sites. It is, therefore, suggested to intercept the water before it enters into the soil blanket and shattered/jointed bed rocks by lining with cement mortar and water from these drains should ultimately be diverted to the nearby natural drainage existing in the area.

Second and third steps include encouraging various types of vegetation that, besides preventing water percolation into the soil cover by holding the soil cover, also offer a considerable benefit, therefore, it is also suggested to carry out afforestation on an extensive scale along hill slopes etc. These varieties, however, need to be selected in consultation with soil conservation Department. These measures are considered absolutely essential as these sites are prone to slope failure, which is manifested in the form of debri slides occurring at these sites.

Adequate number of weep holes, at least two meters apart from each other, should also be provided in these walls. Sometimes, these weep holes get choked due to infiltration of fine soil into these holes. It is suggested that the space behind these weep holes should be back filled with granular material.

Creation of Steep/Vertical Slopes at Some Locations: To prevent any slope failure, the soil bed rock forming these cuttings shall have to be contained. This may be done by constructing well designed gravity retaining walls all along these cuttings.

Retaining structure should also be constructed along hill steep slopes towards down hill sides of different structures proposed to be constructed at these sites.

Properly designed diversion structures at suitable point towards up-stream side of the site are proposed for the construction of Sewage Treatment Plants.

Sewage Treatment Plants

- Wastewater storage dams and wastewater disposal sites may only be located:
  - Outside of a watercourse.
  - Above the 100 year flood line, or alternatively, more than 100 metres from the edge of a water resource or a water supply borehole, which is utilised for drinking water or stock watering.

- On land that is not, or does not overlie, a major aquifer.
  - Ensure that waste water structures are able to handle more than the design capacity.
  - Avoid large and prominent trees, communities and features: it may only be possible to identify these on site, at which time, deviations to the planned alignment should be planned to avoid the drip-lines of large and prominent trees.
  - Ensure that no storm water is allowed to enter any waste water disposal installation. Pay special attention in the Water Management Plan to the control of runoff under

normal and storm conditions (i.e. through shaping, trenches and berms).

Source: Atlantic Canada Wastewater Guidelines Manual

Siting of Sewage Treatment Plants: Siting of Sewage Treatment Plants can reduce pollution load and optimise resource and energy conservation. Siting is the selection of site for wastewater/sewage treatment plant based on features, such as character, topography, and shoreline. Site development should take advantage of the existing site topography. The following principles are important to consider: (i) A site on a side-hill can facilitate gravity flow that will reduce pumping requirements and locate normal sequence of units without excessive excavation or fill; (ii) when landscaping is utilised, it should reflect the character of the surrounding area. Site development should not alter existing naturally stabilised site contours and drainage as little as possible; (iii) the developed site should be compatible with the existing land uses and the comprehensive development plan.

As per MoEF, the site(s) selection can be an effective approach in minimising the requirement of mitigation measures. Proposed project locations should be reviewed based upon regulatory and non-regulatory criteria. Project siting restrictions depend on the sensitivity of the surrounding environment. Sensitivity should be assessed in relation to proximity of the project to the places/sites. The siting criteria delineated by MoEF include: as far as possible, prime agricultural land/forest land may not be converted into an industrial site; Land acquired should be minimum, but sufficient to provide for a green belt wherein the treated wastewater, if possible/suitable, could be utilised from wastewater treatment systems; enough space may be provided for storing solid wastes. The space and the waste can be made available for possible reuse in future; layout and form of the project must conform to the landscape of the area without unduly affecting the scenic features of that place; associated township of the project, if any to be created, must provide space for phyto-graphic barrier between the project and the township and should take into account predominant wind direction.

In addition, the following distances should be maintained:

- Flood plains of the riverine systems: at least 500 metres from flood plain or modified flood plain or flood control systems.
- Transport/communication system: at least 500 metres from highway and railway.
- Major settlements (as per the population density and settlement patterns in a given district) at least 25 kms from the projected growth boundary of the settlement.

In addition to the siting criteria listed above, the proposed project location should be reviewed in relation to the following salient issues:

- Ambient Air, Water and Noise Quality Standards
- Critically polluted areas
- Natural disaster prone areas
- Ecologically sensitive areas
- 10 kms away from Notified Eco-sensitive areas
- 10 kms away from Protected Areas notified under the Wild Life (Protection) Act, 1972
- 10 kms away from Critically Polluted areas as notified by the Central Pollution Control Board from time to time
- 10 kms away from inter-State boundaries and international boundaries.
- Availability of water and other critical infrastructures, like electricity, roads with adequate width and capacity

Source: www.envfor.nic.in

Decentralised Wastewater Treatment Plants Scheme Offer Viable Solution for Sparse Population: Decentralised wastewater treatment was used in the past most commonly to serve sparsely populated communities that were too far from larger areas to have sewers extended to them. As cities grew and overtook these communities, they were brought into centralised systems for reasons of health and cost. Recently, however, decentralised

treatment has seen a resurgence. Sewer pipeline construction can be costly in established neighbourhoods and membrane-based technology has dropped in cost and become more available, allowing for smaller, more locally based treatment plants.

Reclaimed Water and Biogas from Wastewater can be Used for Irrigation and Fuel: Reclaimed water from wastewater is a technology, which is being implemented in wastewater treatment plants around the world. Using membrane technology, water can be purified and used in grey water applications, in irrigation or as a supplement to existing ground and surface water sources during times of low flow.

Biogas is produced by the anaerobic digestion of biodegradable materials such as biomass, sewage, municipal waste, green waste etc. which primarily contains Methane (CH_4) anc Carbon dioxide (CO_2) and small amounts of hydrogen Sulphide (H_2S). Methane escapes from sludge, as it is digested by micro-organisms during the dewatering process in a solid waste facility. Anaerobic digestion has also been shown to degrade persistent organic pollutants, such as dioxins and chlorobenzenes.

Biogas, in many countries in Europe, is already being used to fuel cars, taxis, trucks and public transportation. As a fuel source, it can be refined as a cooking fuel for use in homes and restaurants; biogas can also be used as fuel with some othr fuel such as wood in order to power factories.

Source: http://www.wastewatermadeclear.ca/what/innovations.htm

Case Study 4: Decentralised Domestic Wastewater Treatment in Rural Areas in China

Rural areas, which are less densely populated than urban areas, require a decentralised sewage treatment system to cover a relatively highly populated area rather than a large-scale centralised sewage treatment system as seen in urban areas. In view of the economic situation of rural areas, systems that havelow construction, maintenance and operation costs are required.

Necessity of Domestic Wastewater Treatment in Rural Areas in China: There is less information available on domestic wastewater discharge conditions in rural areas than on those in urban areas, and there are many unknowns. Liu, et al. estimated the nitrogen flow in rural areas by supplementing the existing statistical data with field work surveys, and studied the effects of human life on the flow. They estimated the nitrogen flow in Taoyuan, Hunan and Taihe, Jiangxi located in the middle to lower reach of the Chang Jiang River. Both districts are rice-producing rural areas, but Taoyuan has introduced more machinery into its agriculture. In rural areas in China, raw sewage has been recycled as fertiliser over a long time). The recycle rates of raw sewage in terms of nitrogen in Taoyuan and Taihe were 27 percent and 67 percent, respectively. In Taoyuan, about 70 percent of lavatories have been converted into flush toilets and this shows the gradual development of sewage systems, but sewage treatment has lagged behind the development of sewage systems. In Taihe, on the other hand, the recycle rate of raw sewage is high and flush toilets account for only about 30 percent of all lavatories because vault toilets are widely used, and people there are less satisfied with their toilet conditions than those in Taoyuan. In Taoyuan, chemical fertilisers account for 70 percent of nitrogen input on agricultural land, which reflects the advanced mechanisation of agriculture. These study results suggest that the recycle rates of raw sewage in rural areas will be lowered following the increasing mechanisation of agriculture and improvement in people's living standards, and the necessity of domestic wastewater treatment will be increased. The necessity of domestic wastewater treatment will be further increased at an accelerated speed by new agricultural village construction projects and other urbanisation policies. Thus, construction of domestic wastewater treatment systems in rural areas is an urgent issue to be addressed for the improvement of hygienic conditions in rural areas and the reduction of effects on watersheds.

As part of the Japan-China water environment partnership project agreed on between the leaders of both the countries, the Japanese Ministry of Environment started a four-year rural area decentralised wastewater treatment model project in 2008. This project is intended to install model treatment facilities in some regions with typical requirements or conditions based on the experience of both the countries, and to work on the penetration of these systems in the future. In 2008, treatment systems were installed in Taizhou, Jiangsu and in mountain areas of Chongqing, in light of the conditions of these areas. A gravel contact aeration system and a constructed wetland system were selected for Taizhou and Chongqing, respectively. A gravel contact aeration system based on Japanese technologies and a constructed wetland system based on Chinese technologies were used. Both countries will further study the operation of these treatment systems to promote their penetration in the future.

In Taizhou, a facility with a treatment capacity of 150 m3/day and another facility with a treatment capacity of 40 m3/day

were installed. While the facility with a capacity of 150 m3/day is of reinforced concrete, the facility with a capacity of 40 m3/day uses a liner sheet, concrete blocks, and other building materials rather than concrete building frames to keep the construction cost low. This construction method cannot be used for a large facility, but can keep the construction cost low for an ultra-small facility.

Preliminary Contact Aeration—Constructed Wetland System: Consists mainly of a settling and sludge storage tank, a preliminary contact aeration tank, a sedimentation tank, and a constructed wetland. According to the guidelines in China, wastewater put to a constructed wetland must not contain a Chemical Oxygen Demand of water greater than 200 mg/L, a 5 days Bio Chemical Oxygen Demand of water greater than 70 mg/L, an Suspended Solids level of greater than 40 mg/l, and ammonia nitrogen of greater than 30 mg/L. Since this quality level cannot be achieved by settling separation alone, a preliminary aeration process must be combined. The aeration time was set at four hours, but it must be optimised through actual operations, because the length of the aeration time greatly influences the maintenance and operation cost. Produced sludge can be stored in the sedimentation separation tank for up to about one year. This model project has been promoted based on adequate discussions between the Japanese and Chinese Governments and engineers. Therefore, adaptable cooperation of China can be expected, and the project will be further promoted with the experience of both the countries.

Source: Motoyuki MIZUOCHI, Hideaki KOYANAGI, Tetsuo KUYAMA, Hirokazu IWASAKI; National Institute for Environmental Studies; Ministry of the Environment; Japan.

4.3 Health

Water borne diseases can be prevented at household level by adopting following good practices such as:

At household level, boiling of water or heating with fuel for five minutes has been found to be very effective way for preventing microbial contamination of water. Boiled water should be stored in the same container in which it has been boiled or heated, preferably one with a lid to reduce recontamination.
Source: Managing Water in the Home: Accelerated Health Gains from Improved Water Supply, World Health Organisation.

At household level, sodium hypochlorite and chlorinated isocyanurates (e.g. sodium dichloroisocyanurate [NaDCC] tablets) can be used to disinfect drinking-water.
Source: UNICEF, Promotion of Household Water Treatment and Safe Storage in UNICEF Wash Programmes, January 2008.

Drinking water disinfection by lowering pH with lime juice is effective in reducing cholera risks. Further, lime juice added to non-acidic foods, beverage and water has been found to be a potentially promising household treatment to control cholera transmission.
Source: Managing Water in the Home: Accelerated Health Gains from Improved Water Supply, World Health Organisation

Ion exchange processes have been found to be effective for disinfection and purification of drinking water. In this process, tri-iodine and penta-iodine exchange resin is used for disinfection process both at household and community level.
Source: Managing Water in the Home: Accelerated Health Gains from Improved Water Supply, World Health Organisation

In rural areas, where open defecation is practiced, pit latrines are provided at community and household level for improving sanitation. Provision of latrines also provides the users access to soap, ash and water leading to higher personal hygiene. In case, groundwater is used as a drinking water source, then the following safeguards should be adopted.

- A minimum of 15 metres distance should be kept between latrine and downstream groundwater abstraction point.
- In case of space constraint between the latrine and the water extraction point, water from an upper level in the aquifer should be extracted.
- Where groundwater is shallow, artificial barriers of sand around latrine and pits can control groundwater contamination.

Source: A Guide to Development of on-site Sanitation, World Health Organisation, 1992.

Solar disinfection, which synergistically applies the biocidal action of heat and ultraviolet radiation, has been found to be effective, both microbiologically and in reducing diarrhoeal diseases and cholera. Further, if a dark, opaque container with water is used for solar

disinfection, then efficacy of disinfection increases.
Source: UNICEF, Promotion of Household Water Treatment and Safe Storage in UNICEF Wash Programmes, January 2008

Flocculation/coagulation and time released disinfection all combined in a single product, e.g., powder in a sachet, has been found to be highly effective for complete microbial protection and in prevention of diarrhoeal diseases when used for water purification at household level.
Source: Managing Water in the Home: Accelerated Health Gains from Improved Water Supply, World Health Organisation.

In rural areas, source of water should be protected from cattle shed washing by diverting it into a storage pit, which can be used for agriculture.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Water sources, e.g., spring can be protected by constructing a concrete wall around it. This will not only protect water from solid waste scattered around it, but also provide quick collection of water for usage.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Provision of separate drinking water supply for animals has been found to protect the source of water for human consumption. Diversion of household waste water into grey water pits instead of discharge into backyard or open drain will result in grey water recycling. This grey water can be used for agriculture.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Provision of compost pit for disposal of biodegradable solid waste, which, otherwise, is disposed outside the households in rural areas. This practice has been found to prevent contamination from flies, a major contributor to the spread of diarrhoea. Provision of trash bins at selected places in villages has been found to divert rubbish at one place, thereby contributing in reduction of disease.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

In rural areas, the contents of soak pits, after a year of its disuse, can be used as soil conditioner, thereby reducing consumption of chemical fertilisers, which results in reduced pollution from agriculture runoff in source of water.
Source: A Guide to Development of on-site Sanitation, World Health Organisation, 1992.

Provision of concrete tanks for storage of water in rural areas not only provide improved access to water, but also results in improvement of hygiene and reduction of diseases.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand

Participatory approach has been adopted as part of Slum Improvement Project (SIP) to provide water supply and sanitation facilities in urban areas. This has been achieved based on the contribution of households towards meeting the implementation costs of the project and creation of infrastructure at community household level. Further, the SIP has significantly raised levels of awareness, particularly, in health and sanitation among slum dwellers, resulting in significant reduction in the incidences of numerous water supply and sanitation related diseases. These best practices have been pilot tested in slum areas of Dhaka in Bangladesh and Ahmedabad, Gujarat in India and replicated in other urban centres too.
Source: www.unhabitat.org/best practices, Best practice for demonstrating Slum Improvement Project in Dhaka Metropolitant City, Bangladesh, Case Study Ahmedabad Slum Networking Programme-India

Before the establishment of common Bio Medical Waste management facility, deep burial method was practiced for the purpose of disposal. It may not be possible for small nursing homes, dispensaries, clinical laboratories and other small organisations or individual medical professionals to carry out treatment and disposal of Bio-Medical Waste generated as per the methods prescribed in the

rules and guidelines on their own. Neither it is economical for even bigger hospitals to have their own treatment facilities. A Centralised Bio-Medical Waste Treatment Facility (CBMWTF) has been found to provide an ideal solution to all such problems. In this system, all activities starting from the collection of Bio Medical Waste till its treatment in a CBMWTF and final disposal is entrusted to the facility operator, who is operating the plant on Build Own Operate and Transfer (BOOT) basis. This practice has been adopted by Urban Local Bodies in India. Treatment technologies specified are incineration and sterilisation (autoclaving) followed by shredding.

Source: www.indiaurbanportal.in

Incineration, when used according to 'Best Practices', can be a cheap and comparatively less hazardous way of disposing off health care waste. This set of guidelines provides clear technical specifications and engineering drawings for each component of the De Montfort incinerator. It also presents an integrated solution with waste and burned waste storage provision, along with shelter, security, starting fuel, tools, protective clothing and recordkeeping, as a part of the Waste Disposal Unit (WDU).

Source: Managing Health Care Waste Disposal, Guideline on how to construct, use and maintain a waste disposal unit, World Health Organisation, September 2004

World Health Organization has prepared a document to provide guidance for selecting the most appropriate option for managing solid waste generated at Primary Healthcare Centres (PHCs) in developing countries. The main tool of this guide consists of six decision-trees aimed at assisting the user in identifying appropriate waste management methods. The six basic elements include waste minimisation, segregation, codification, handling, transportation, treatment and disposal. The guide takes into consideration the most relevant local conditions, the safety of workers and of the general public as well as the environmental criteria. The decision-making process helps in selecting adequate options for the safe disposal of wastes at Primary Health Centres level.

Source: Management of solid health-care waste at primary health-care centres – A decision making guide: Immunisation, Vaccines and Biologicals (IVB), Protection of the Human Water, Sanitation and Health (WSH), World Health Organisation, 2005

WHO has prepared pediatrician awareness pamphlet related to urban and rural air pollution. This material aims at providing essential information and guidance about impacts of indoor and outdoor air pollution to paediatricians and other professionals involved in child health. This material will assist them to diagnose the environment related root causes of ill health among children.

Source: Pediatrician awareness pamphlet, World Health Organisation

Development of green belt and tree planting in rural and urban areas by communities has been found to be effective to control air pollution. Specific location of plantation in a geographic area can be fixed based on emissions modeling from vehicular movement and industries in that area. This practice can be implemented by the communities in association with Urban Local Bodies and industries globally and has been found to be effective and sustainable. Such approach has been adopted in communities in India too.

Source: The Hamilton-Wentworth Air Quality (HAQI) Initiative and Vision 2020, Canada, www.unhabitat.org/bestpractices,

Automation of manual handling operations including fuel handling system can reduce the contact between workers and process materials. Elimination and controlling of sources of dust including extract systems/filters and maintenance programmes aimed at eliminating leak sources can reduce dust emissions and worker's exposure. Further, smoke free work place can reduce worker's exposure to smoke.

Source: Environment, Health and Safety Performance Improvement, Towards a Sustainable Cement Industry, World Business Council for Sustainable Development, December 2002.

Infant malnutrition and mortality can be reduced by promotion of appropriate infant and child feeding practices from birth through the first two years of life. Further, providing supplementary diets to pregnant and lactating mothers, which could cater to 417.8 to 500

kcal/day of additional energy requirements, can reduce deterioration of mother's health due to malnutrition. Some of the measures include the following.

- Increasing nutrient density and quality of food by adding oil, sugar, animal products, and vitamin-rich fruits.
- Hand washing and serving all foods immediately after preparation to reduce possibility of contamination.
- Providing iron supplements during pregnancy to mother

Source: TRM-OI: Preventing Malnutrition in Children under Approach (PM2A): A Food-Assisted Approach, USAID, March 2010.

Peer led outreach education, programmes support clinical services to treat sexually transmitted diseases (STDs), community distribution of temporary contraceptive methods (free condoms for target population) and facilitating community mobilisation and capacity building for community ownership of the programme have been found to be the best practices for target groups to prevent HIV AIDS. These could be applied along major truck routes, tourist destinations and industrial areas in Himachal Pradesh.

Source: AVAHAN – The India AIDS Initiative: The Business of HIV Prevention at Scale, Bill & Melinda Gates Foundations.

4.4 Road & Transport

A number of good practices for the sector have been compiled based on documented State, National and International level best practices and experiences. These best practices are summarised in the following section.

Technology/Practices of Road Development: The roads will be constructed with effective and eco-friendly technologies. There is need to strengthen the database system for all roads including State Highways and Major District Roads. An institutionalised system to collect data of road length, road and bridge inventory, traffic flows and road condition of various categories and publish it, should be established. Such data on Road Information System should also be put on websites at the State and National levels.

Bio-Engineering can be Used for Slope Stabilisation: Bio-engineering is the use of vegetation, either alone or in conjunction with civil engineering structures, to reduce instability and erosion on slopes. It should be a fundamental part of the design and construction of all roads in rural (and urban) hill areas, mainly because it provides one of the best ways to armour slopes against erosion. Because of the steep and dynamic slopes found in the Himalayas, most hill roads are engineered near to the margin of safety. Bio-engineering is an effective way of enhancing civil engineering structures to increase stability as far as possible. It is relatively low in cost, uses local materials and skill and provides livelihood benefits through economically useful products.

The practical options for bio-engineering in environments such as those found in Himachal Pradesh can be summarised as: a) Grass planting: large clump grasses can be planted in various configurations, such as contour, diagonal or even down slope lines, depending on the characteristics of the materials, and perhaps combined with a jute or synthetic geo-textile. This provides erosion control and shallow reinforcement; b) Vegetative structures using hardwood cuttings: brush layers, fascines and palisades, with the angle of the lines determined by the type of material and slope on which they are applied. These also control erosion, catch debris and provide strong, fibrous root reinforcement; c) Tree planting, as part of a plant community with under storey of shrubs and grasses: a wide range of possibilities are available to suit all environmental conditions. Tree roots offer greater reinforcement and anchorage. Many of the bio-engineering techniques most appropriate for the roadside slopes of Himachal Pradesh require the intensive use of grass planting, using slips produced through vegetative propagation. This is technically straightforward and suitable species are available locally, but current nursery capacity of the Himachal Pradesh Public Works Department will need to

be expanded to provide an adequate volume of soil beds to allow the bulking-up of grass clumps. Current capacity is adequate for the provision of other bio-engineering materials (containerised seedlings and rooted hardwood cuttings), though a range of different species will need to be introduced. These will all be either local or derived from ecologically similar sources in nearby States.

Source:, Comments of HP PWD on draft sectoral Guidelines of Road and Transport received vide letter no. PW-WBP/EMP-60

Use of Road Information System for Pavement Management System (PMS): The PMS based on the rationale of assessment of distress and decision support system for taking up the maintenance activities is to be introduced for productive use of meagre resources. National Highway Authority of India (NHAI) has developed Road Information System (RIS), which will include the inventory of the National Highways with National Highway Authority of India (NHAI) and also be used for the Pavement Management System purpose. Similarly, the Ministry has started developing a programme for inventorisation and Pavement Management System with the assistance of Central Road Research Institute.

Source:www.nhai.org

Mechanism of Payment Maintenance can Assist in Preventive as well as General Maintenance: Several machines for repair of distresses in pavements have been introduced. Their use would need to be encouraged to improve the maintenance culture. Similarly, Mobile Bridge Inspection Units are also to be procured for proper inspection/distresses in bridges.

Out Sourcing of Maintenance Contract can Improve Maintenance Efficiency and Accountability: Traditionally, road maintenance works are executed departmentally by the Public Works Department. In order to raise efficiency, these maintenance works may be outsourced to the Private Sector. National Highway Authority of India (NHAI) has introduced operation, maintenance and tolling contract for the National Highways entrusted with NHAI. Similar concepts need to be started for the National Highways with the State PWDs.

Source: www.nhai.org and comments of HP PWD on draft sectoral Guidelines of Road and Transport received vide letter no. PW-WBP/EMP-60

A Comprehensive Corridor Management System can Improve Highway/Road Maintenance and Transport Efficiency: It is being increasingly appreciated that the maintenance of only road and bridge sections of National Highways are not sufficient for safe movement of vehicles. Corridor Management, which comprises comprehensive management of the road section including engineering and non-engineering aspects are to be introduced for proper management and maintenance of National Highway sections.

Source:www.nhai.org

Usage of Integrated Quality Assurance System and Environmental Management System can Assist to Improve Highway/Road Condition: The Himachal Pradesh Public Works Department is moving towards accreditation for quality assurance and environmental management systems, which cover environmental issues of corporate activities, including an environment policy and overall environment strategy and management systems. Both are important for the introduction of a well organised system of slope stabilisation and protection works as ISO series of standards. The Department would develop specific environmental measures, such as how to cope with spoil during maintenance (as distinct from during construction and widening). Hence part of the environmental strategy must be the assigning of designated dumping sites in safe areas and the acceptance that additional haulage costs will be balanced against reduced maintenance costs. Other related topics that will be covered under this strategy include general construction management, labour and equipment camps, waste disposal, worker safety, traffic management, preservation and plantation of trees, and water use in construction.

Source: www.nhai.org/ ; HP PWD, Comments received vide letter no. PW-WBP/EMP-60

Development of Tourism/Eco-tourism Master Plan: Tourism planning should be undertaken as part of the overall development plan for any area (including its land-use plan), and not undertaken in isolation. Ensure that, wherever tourism occurs or is liable to occur, the corresponding land-use plan should include a component of tourism land-use, carefully zoning the areas as regards the type of tourism that should take place: high, middle or low intensity. Zoning is a tool required in any land or water-use plan and should always be used to regulate utilisation of the land and water resource over the long term. A good example of a comprehensive tourism zoning plan includes specific zones, such as: a) strictly protected zone (sometimes called 'sanctuary' or 'absolute reserve' zones), where the presence of all types of tourists and tourist infrastructure are strictly prohibited; b) restricted tourism zone (sometimes called 'wilderness' zone), where access is allowed only to a limited number of tourists, usually on foot (or, in some cases, by rowboat); c) moderate tourism zone, where visitors are encouraged to carry out diverse low-impact activities compatible with the natural and/or cultural environment; d) semi-intensive tourism development zone, which should always be an area of limited extent (especially when near environmentally-sensitive natural areas), where some moderate-impact facilities are included (e.g., eco-lodge, visitor centre, limited parking areas); e) Intensive tourism development zone, which should only occur in highly popular mass tourism destinations (e.g., beach resorts, ski resorts, amusement and theme parks), where a considerable degree of concentration of tourists and tourist facilities takes place. Planning should endeavour to minimise negative impacts, including pollution of air, water, and soil resources. As part of Tourism Master Plan, water supply, sewage and Municipal Solid Waste should be included as important components.

Source: Integrating Biodiversity into the Tourism Sector/Best Practice Guidelines, www.uneptie.org/tourism/bestprac.html

Public Private Partnership for Developing Tourist Infrastructure: In developing tourism products, infrastructure projects can be initiated through Build Operate Transfer (BOT) Mechanism. Land Bank Scheme to create physical facility, earmarking certain land on the tourist places, wayside locations and State/National Highways for the tourism projects both in the rural and urban areas are a few examples in Gujarat. Another example in Gujarat where the Sardar Sarovar Narmada Nigam Ltd. has invited Private Sector participation for the development of infrastructure facilities with a view to create an attractive tourist destination in an area of 1400 hectares of land, downstream of the Sardar Sarovar Dam, consisting of light deciduous forest interspersed with lakes, grasslands, streams, hillocks and rivulets.

Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Case Study 1: Private Sector Participation for Eco-tourism, Jungle Lodges and Resorts (JLR) is a responsible wildlife and eco tourism company with a strong commitment to use tourism as a genuine tool for conserving the environment and wildlife. The company provides accommodation with consultation of Chief Wildlife Warden of the State. These sanctuaries are Bandipur National Park, Nagarhole National Park and a number of Karnataka's other wildlife sanctuaries, including tented camps on the Kali River in the Dandeli Wildlife Sanctuary and in the Biligiri Rangaswamy Wildlife Sanctuary. All of JLR's resorts and camps are located in some of Karnataka's ecologically sensitive yet amazing natural destinations. Clean and superior facilities, package deals and the Kabini River Lodge's excellent cuisine have won Jungle Lodges & Resorts international acclaim. JLR has also been awarded as the Best Eco-tourism Company in India by the Prime Minister, Government of India in 1999.

Effectiveness of Participatory Planning on Urban Transportation: Participatory planning can assist in addressing urban transportation issues. This has been demonstrated in Dar es Salaam City, Tanzania.

Case Study 2: Dar es Salaam City, the primate city of Tanzania, accommodates over 2.5 million people according to 2002 census. The city has grown from a population of mere 5,000 people at the turn of the 20th century. Its metropolitan regional area extends for 60 kilometers to the south, north and west, as it is located on the west coast of the Indian Ocean. As such, commuting by its population along its four radial roads exerts great pressure on its transportation resources. The city's transport system comprises mainly mini-bus public transportation, standard-bus inter-city public transportation, private motorcars, cycling, walking, and carts and lorries for goods. The demand side far exceeds the supply side

in terms of limited road density, quality, form and pattern. As a result, traffic jamming and road congestion, road accidents, locational inaccessibility and limited traffic mobility have led to traffic delay and reduced city's productivity.

In the early 1990s, through the Sustainable Dar es Salaam Project, the city stakeholders mobilised themselves to participate and partner in deliberating upon the critical and crosscutting dominant problems including city transportation with a view to agreeing on workable strategies and bankable projects to address them. Such participatory city planning process with respect to this city has been practiced for the past one decade and its fruits and effectiveness are just beginning to emerge today. Among the sub-issues that the city stakeholders have indulged upon include the following: city-centre parking; decongestion of city-centre public-bus terminals; introduction of one-way streets; city-centre road resurfacing; construction of additional ring roads; construction of a suburban city central public-bus terminal; upgrading of city-wide public bus terminals; introduction of city public sea-boat transport; introduction of parking garages for heavy-goods vehicles as well as multi-storey garages at new office-accommodation buildings; streamlining public bus transport and measures to reduce transport-related environmental pollution. These sub-issues had been identified and deliberated upon by city stakeholders from the Government, business and civil-society sectors. As such, agreeing on action areas, action strategies, action projects and resource mobilisation have been very much facilitated. From the evaluation studies that Ms. Hawa Issa, as my undergraduate student of the Bachelor of Science in Urban and Regional Planning, has done in the first five months of this year (2003), it is evident that the implementation rate is rated satisfactory, while impact analyses show greater stakeholder satisfaction than the earlier city planning practices that assumed the Government to be the sole doer and provider. There is now an increasing rate of Public-Private Partnerships in addressing such crosscutting issues as city transportation.

Source: Effectiveness of participatory planning on urban transportation in Dar es Salaam City, Tanzania; Francos Halla; UCLAS, Dar es Salaam, Tanzania

Transportation and Mobility: Evolving a World Class Land Transport System through effective planning and implementation.

Case Study 3: Effective planning and implementation of transport system in Singapore

Singapore has a population of 4,017,733 persons and covers a total area of 402 sq. kms. In Singapore, as with many large Asian cities, transportation issues are a major concern among ordinary citizens and policy-makers alike. Road congestion is the most common problem. The Singapore initiative in urban land transport development and management seeks to solve worsening traffic congestion and its associated problems by building a world class land transport system. The vision, implemented by the Central Government, is a land transport system that meets the needs and demands of a dynamic and growing city.

First mooted in 1995, the proposal of a world class land transport system consolidates more than two decades' of ongoing work on managing traffic congestion and road space. The initiative is premised on four key principles of: (i) integrating transport and land use planning; (ii) expanding the road network and maximising its capacity; (iii) managing demand of road usage; and (iv) providing quality public transport choices. The Singapore initiative has resulted in relatively congestion-free roads (3281 kms of roads taking up some 11% of the country's land) in the city-state. The average peak-hour travelling speed within its city centre is about 30 kilo metres an hour, which compares favourably with peak-hour speeds of 10 to 12 kilo metres per hour in London, New York, Manila, Calcutta and Lagos. In addition, it was the first attempt to use road pricing to limit the growth of urban traffic. From April 1998, Singapore replaced its system of central area-access charges based on paper licenses (first introduced in 1975) by electronic tolls that vary according to the time of day.

Singapore's integrated approach in tackling traffic congestion is premised not only on the traditional means of increasing transport capacity through road building programme, but also on innovative measures to manage demand for road space by encouraging more efficient use of existing transport facilities, especially within the usually congested city area. This it does by planning and developing an alternative urban structure where economic activities become dispersed and there is better physical integration between employment, amenities and housing, implementing car ownership and usage restraints and promoting a public transport system as a viable alternative to the private car. Many of Singapore's transport policies are universally applicable, especially the use of area licensing scheme, control of car population through various fiscal measures, promotion and establishment of a more efficient public transportation system, highly integrated land use and transportation planning.

Source:http://www.bestpractices.org/bpbriefs/urban_ infrastructure.html

Use of Green Technologies for Transportation: Some of the green technologies, which are used in transportation, include energy efficient lighting for traffic and street lights, recycled materials for road pavement construction, and construction methods that minimise the impact on the environment. The application of the green transport technologies, such as the diesel hybrid buses and diesel particulate would significantly reduce air pollutant emissions from diesel-driven vehicles.

Electric Vehicles (EVs) can offer significant advantages in pollution reduction and energy efficiency as compared to internal combustion engine vehicles. Car manufacturers like General Motors, Renault-Nissan, BMW, Mitsubishi and Tesla have started manufacturing electric vehicles. Countries are looking towards electric vehicles and the use of other clean and efficient transport technologies as growth opportunities in smart transportation. Israel has announced aggressive plans to go electric for their cars from 2011 and London has pledged to be the electric capital of Europe. In the United States, Los Angeles and San Francisco have been named two of the top Electric Vehicle cities in the country. Seoul introduced its first electric bus in April this year, and will be launching replacement of its buses and taxis with electric or hybrid vehicles over the next 10 years.
Source:http://www.thegovmonitor.com/world_news/asia/singapore-outlines-plans-to-encourage-use-of-green-technologies-34803.html

4.5 Mining & Geology

Addressing Biodiversity as Part of Corporate Policy: Many mining companies have adopted an increasingly sophisticated approach to managing biodiversity as part of their commitment to establishing and maintaining a social or functional 'licence to operate'. For example, adopting responsible practices with respect to biodiversity management is increasingly viewed as important with respect to: access to land, both at the initial stages of project development and for ongoing exploration to extend the lifetime of existing projects; reputation, which links to 'licence to operate', an intangible but significant benefit to business, and which can profoundly influence the perception of the communities, NGOs and other stakeholders of existing or proposed mining operations; and access to capital, particularly, where project finance is to be obtained from one of the investment banks that are signatories to the Equator Principles, which apply the Biodiversity Performance Standard of the International Finance Corporation (IFC) to all investments in excess of $10 million (recognising that strengthened commitments to biodiversity assessment and management are likely to be adopted).

In addition, good biodiversity management can bring benefits to mining companies, such as:

- Increased investor confidence and loyalty;
- Shorter and less contentious permitting cycles, as a result of better relationships with regulatory agencies;
- Improved community relations;
- Strong supportive partnerships with NGOs;
- Improved employee motivation; and
- Reduced risks and liabilities.

This Good Practice Guidance provides the mining industry with an outline of the steps required to improve biodiversity management throughout the mining cycle. Ultimately, through implementation of this Good Practices Guidance, mining companies would minimise the likelihood of negative impacts on biodiversity, project delays and damage to their reputations.

Case Study 1: A strategic response to biodiversity conservation – Rio Tinto

Rio Tinto has developed a strategic response to biodiversity conservation and management, designed to enable the company to meet the wide range of expectations of many different constituencies with interests inthe company and its activities.

As a first step in developing a biodiversity strategy, partnerships were formed with leading conservation organisations, such as Earthwatch Institute, BirdLife International, Fauna & Flora International and the Royal Botanic Gardens, Kew.

These relationships provided a conservation perspective on the opportunities and challenges raised by the mining process and were an essential part of designing how to proceed. A detailed survey of the level of awareness and management of biodiversity issues at all levels of operations was carried out. A paper setting out a strong business case for developing a biodiversity strategy was put to senior management.
The development of the strategy was managed by a Rio Tinto steering group formed in 2002 and supported by an external advisory panel. The internal steering group included senior representatives from Rio Tinto operations as well as Exploration, Corporate Health, Safety and Environment, and Corporate Community Relations departments. The external advisory panel consisted of six invited international experts from conservation and community development organisations, including some of Rio Tinto's biodiversity partners.

The elements of the Rio Tinto biodiversity strategy have been developed to help corporate and operational staff improve biodiversity performance through:

- Identification of biodiversity risks and opportunity
- Development and implementation of biodiversity programmes
- Recognition of synergies and challenges with sustainable communities programmes
- Identification and development of strategic and operational partnerships, and,
- Effective corporate assurance

The strategy provides a framework to bring together the interests and concerns of several groups, including indigenous landowners, affected communities, investors, employees, NGOs, regulators, scientific and finance communities. Outputs from the strategy include a position statement, guiding principles, a detailed guidance document and case studies.

The Strategy was launched at the World Conservation Forum in Bangkok in November 2004. It is being implemented across the Rio Tinto Group with particular emphasis on new projects. As with the development of the strategy, the company's biodiversity partner organisations are actively involved in implementation. They are supporting group businesses in the design and development of biodiversity programmes appropriate to local biodiversity risks and opportunities.

Working groups have been formed to continue the development of additional guidance on biodiversity indicators, metrics and targets, and on the issues surrounding the use of biodiversity offsets. Both groups have membership drawn from conservation and development organisations as well as corporate and operational staff from Rio Tinto.

Source: Good Practice Guidance for Mining and Biodiversity ICMM International Council on Mining & Metals 2006, Available from: ICMM, www. icmm.com, info@icmm.com

Recommended Practices during Exploration: Some recommended practices for limiting impacts on biodiversity during exploration include:

- Limiting land clearing by using technologies and mining practices that minimise habitat disturbance;
- Avoiding road building wherever possible by using helicopters or existing tracks – if roads are to be constructed, use existing corridors and build away from steep slopes or waterways;
- Using lighter and more efficient equipments to reduce impacts on biodiversity;
- Positioning drill holes and trenches away from sensitive areas;
- Capping or plugging of drill holes to prevent small mammals from becoming trapped;
- Removing and reclaiming roads and tracks that are no longer needed; and
- Using native vegetation to revegetate land cleared during exploration.

Effective Consultation with Key Stakeholders: Consultations with stakeholders on matters relating to closure should commence early and initially focus on broader issues of post-closure land uses. However, as additional information becomes available on biodiversity through ongoing monitoring and surveys, rehabilitation scenarios can be developed, ideally with the involvement of stakeholders. This was the approach adopted at Misima Mines in Papua New Guinea (PNG).

Case Study 2: Sustainable post-closure land uses – Misima Mines Limited, Papua New Guinea

Placer Dome Asia Pacific's Misima Mine is located on the island of Misima, some 600 kilometres east of the Papua New Guinea capital, Port Moresby. The climate is tropical, with high temperatures and average rainfall of 3,000 millimetres a year. The original vegetation was predominantly wet tropical rain forest, but there are now substantial areas of secondary growth consisting of regrowth forests (following logging to produce timber for early mining activities) and old 'gardens' (cleared patches that locals used for subsistence gardens). The forest and secondary vegetation are used by local villagers as a source of building timbers, wood for carving, food (edible fruits and nuts, hunting and egg collecting), flowers for decoration and medicinal and ceremonial fruits and leaves.

Although artisanal mining commenced in the 1880s, Misima Mines developed a modern open-cut mining operation in the 1980s. The mine is now in the final stages of closure and serves as a good example of how biodiversity considerations can be integrated into closure planning to meet the socio-economic and cultural needs of the local population. The company recognised that complete restoration of the pre-impact ecosystem was not a realistic objective. Through extensive consultation with the PNG Government and the community, the company developed a rehabilitation strategy designed to meet the requirements of the local people in terms of garden land and forest products as well as environmental goals, such as long-term stability, biodiversity and ecosystem resilience. The objective of the revegetation programme is 'to form a stable, biologically diverse and resilient ecosystem that is productive for future generations, either as forest or subsistence agricultural land'. Revegetation of mine dumps is accomplished in three stages, using locals employed from the clan to which the land will revert. Stabilisation involves the rapid establishment of grass and legume ground covers to protect the soil from erosion. These also produce organic matter and build up soil nitrogen. Phase 1 planting consists of establishing 12 rapid- growing species of shade trees that can tolerate the relatively exposed conditions. Finally, after three to four years, the trees form a dense canopy that reduces the density of groundcover plants and allows Phase 2 planting of 'climax' forest tree species to take place. Recognising the importance of botanical diversity in the forest, the company is planting around 70 different tree species, propagated in the local nursery.

Progressive rehabilitation has meant that when milling operations ceased in May 2004, 80 percent of disturbed areas had already been rehabilitated. Over time, colonisation from unmined areas will increase the number of species present, resulting in biodiversity objectives being met and the development of a sustainable forest capable of meeting the community's needs. However, it is acknowledged that sites will not be able to be used as gardens in the near future until soil nutrients re-establish to levels suitable for supporting garden activities. A monitoring programme has been implemented to assess progress towards the long-term rehabilitation objectives. Training and research programmes have been established to provide the community with the knowledge and skills necessary to sustainably manage the forest in conjunction with other commercial agricultural cash crops, such as coconuts, vanilla and bananas.

Note: Barrick Gold Inc. took over Placer Dome in early 2006 and now has this site under its closure department.

Source: Good Practice Guidance for Mining and Biodiversity ICMM International Council on Mining & Metals 2006, Available from: ICMM, www. icmm.com, info@icmm.com

Restoring Botanical Richness and Re-establishing Native Ecosystem: While many mining companies have achieved remarkable results in re-establishing native ecosystems (see Box), where cost or other site-limiting factors make this impractical, other objectives that still provide biodiversity values should be considered. Examples include:

- Revegetation using important functional species (for erosion control, for instance, or nitrogen fixation), species with aesthetic value, and any local species important for biodiversity conservation that is practical to establish, while guarding against the introduction of exotic/non-native species that could proliferate without adequate controls;
- Situations where other land uses, such as the production of foods, medicines or cultural values are a priority – in these instances, re-establishment of biodiversity values may be a secondary, but compatible objective;
- Re-establishment of key species, such as rare or threatened plant species, or development of habitat suitable for the recolonisation of rare or threatened fauna species; and
- Rehabilitation that is stable, sustainable and includes the use of native species where possible.

Examples of the latter might include the surface of a tailing dam, where soil structure and chemistry are very different from those of nearby unmined areas. Nevertheless, every effort should be made to construct a soil

profile suitable for plant growth and to establish local native plant species that will replace some biodiversity, while still fulfilling critical functions, such as erosion protection and water uptake.

Case Study 3: Restoring botanical richness after bauxite mining – the Jarrah Forest, Southwestern Australia

Alcoa World Alumina Australia operates two bauxite mines at Willowdale and Huntly in the Darling Range of southwestern Australia. The Huntly mine is the largest bauxite producer in the world. The mine pits range in size from one hectare to tens of hectares. Alcoa's aim after bauxite mining is to re-establish all the pre-existing land uses of the forest. Re- establishing the jarrah forest on the mined areas that is as similar to the original forest as possible was determined to be the best way to achieve this goal.

The jarrah forest is a highly valued resource for the people of Western Australia. It is renowned for its diverse flora, being one of the most plant-species-rich forests in the world outside of tropical rain forests. Restoring botanical richness is, thus, seen as an important objective for re- establishing a jarrah forest.

The programme started with five-year improvement milestones. The first milestone was to achieve 80 percent of forest-species richness. When this was accomplished, a new milestone was set for 2000 – that, on average, 100 percent of the indigenous plant species found in representative jarrah forest sites would also be found in a 15-month-old rehabilitation, with at least 20 percent of those found being from a resistant species priority list.

Alcoa reached its goal. In 2000, the company achieved an average of 100 percent at Huntly and Willowdale – in other words, all the rehabilitated areas had, on average, the same number of indigenous plant species as found in nearby jarrah forests. The goal now is to maintain this good record and thus the botanical richness of the area after mining. It is within this context that Alcoa has developed a scientifically based, best practice rehabilitation procedure.

Source: Good Practice Guidance for Mining and Biodiversity ICMM International Council on Mining & Metals 2006, Available from: ICMM, www. icmm.com, info@icmm.com

Preparation of Biodiversity Action Plans: A Biodiversity Action Plan (BAP) is a mechanism by which the objectives and targets for biodiversity conservation can be achieved. BAPs can either be stand-alone plans or be incorporated into the Environment Management System. Numerous specific elements may be covered in a BAP.

Control of Access to Areas of Importance for Biodiversity: Access should be controlled to areas of importance for biodiversity that do not need to be disturbed during operations, to prevent inadvertent destruction of habitats or disturbance of species. In particular, corridors that allow safe movement of fauna must be protected and maintained, especially where larger animals may move through the area (such as migrating caribou in the Arctic or large mammals in Africa). In many areas where mining occurs, extensive clearing for agricultural purposes has already occurred, resulting in the fragmentation and degradation of remnant habitat. In such cases, it is important that companies implement effective clearing controls to prevent further fragmentation and isolation of fauna populations and, where appropriate, they combine this with initiatives, such as construction of corridors to re-establish linkages between remaining areas of native habitat.

Clear Demarcation of all Protected Areas is Required to Avoid Inadvertent Destruction through Ignorance or Carelessness: In some areas, this will require fencing. In other cases, such as large areas where fencing is impractical, measures to avoid unintentional destruction of biodiversity will need to be implemented in conjunction with other landholders.

Controls on How Vegetation (and Associated Fauna) are Removed Need to be Specified: This helps to maximise the use of seed and other plant propagules, soil nutrients and soil biota, decaying organic matter, logs and other potential fauna habitat that can be valuable for rehabilitation. This will help ensure that clearing operations are fully integrated with the requirements of subsequent rehabilitation operations.

Management of Pest Plants and Animals: Introduction of pest species in the form of weeds and feral fauna species has often accompanied expansion of mining into green field areas. In some cases, these pests can have significant impact on local species well beyond the mine lease area. A good example is the introduction of domestic cats into areas with no similar predators. There have also been a number of examples where rehabilitation has introduced weed species that have become pests due to their success in colonising disturbed areas. Strict controls on employees keeping native animals as pets and vehicle washing/disinfection to control weeds and plant disease are all examples of controls that may be required.

Management of Community Biodiversity Uses and other Ecosystem Services: In areas where communities are directly dependent on biodiversity for 'provisioning services', particular attention may be needed to ensure the management and maintenance of the aspects of biodiversity that communities depend on (fisheries, fuelwood, medicinal plants, and so on). More generally, other ecosystem services (such as the role of wetlands in the vicinity of the mine in regulating water quality) may need to be explicitly considered within a Biodiversity Action Plan.

Research and Development Programmes: In the Environment & Social Imapct Assessment (ESIA) phase, gaps in knowledge of biodiversity on the site and in adjacent areas may have been identified and addressed to the extent necessary to gain project approval. In the operational phase, that knowledge base can be further developed through ongoing research. This research is usually targeted towards gaining additional knowledge that improves revegetation/rehabilitation. However, there are likely to be other research opportunities that relate to the broader region surrounding the mine. These may include understanding the impacts of land use changes in the area (that may have resulted from secondary impacts) and the behaviour of invasive pests through to integration into species recovery programmes and other detailed studies of patterns of biodiversity usage by the local community.

Revegetation Trials: These are a specific subset of research programmes aimed at gaining more information on the nuances of the requirements and techniques for successful rehabilitation.

Research on Aspects Relevant to the Wider Setting of the Mine: This may also be required or be valuable in providing a better understanding of regional interactions. This is often the case where mines have been established in remote areas that have been poorly studied and where an Environment & Social Imapct Assessment may represent the only intensive study. Extending the range of that knowledge base may provide additional information relevant to the site and may extend the overall knowledge base.

Topsoil Handling: Topsoil can serve a number of important functions, such as the supply of seed and other propagules, beneficial micro-organisms and nutrients, and can enable the rapid development of groundcover. The topsoil handling plan will need to address sources, collecting depth, the volumes and handling equipment needed, respreading depth and any follow-up treatment (such as scarifying prior to seeding). Where topsoil needs to be stockpiled, the structures should be built to minimise deterioration of seed, nutrients and soil biota, for example, by not collecting topsoil that is saturated following rainfall (which promotes composting), creating stockpiles of lower height (one to two metres), seeding stockpiles with a cover of native vegetation (preferably N-fixing legumes) and minimising the duration of stockpiling. The importance of care in handling topsoil in order to ensure the longer-term re-establishment of biodiversity was evident from research conducted by Alcoa World Alumina in Australia.

Case Study 4: Top soil handling to establish botanical diversity – Alcoa World Alumina Australia

Where topsoil contains a viable native seed source, it should be conserved for reuse following mining. This not only provides a cheap source of plants, it helps ensure that they establish in relative abundances that reflect pre–mining densities and promotes establishment of species whose seed may be hard to obtain or difficult to germinate.

The bauxite mine rehabilitation programme conducted by Alcoa World Alumina Australia in the jarrah forest of south-western Australia is an excellent example of how conservation of the soil seedbank significantly enhanced the botanical diversity of the post-mining vegetation community. After vegetation is cleared, the top 150 millimetres of soil, which contains most of the soil seed bank and nutrients, is strippe d prior to mining and then directly returned to a pit about to be rehabilitated, wherever possible. Research has shown that the majority of native plant species (72 percent) on rehabilitated areas come from seed stored in topsoil. The importance of directly returning fresh topsoil has been demonstrated by trials comparing this technique with stockpiling. These have shown that disturbance associated with direct return of topsoil results in loss of less than 50 percent of the seed contained in the pre-mining forest seed store; in contrast, stockpiling results in losses of 80-90 percent.

Other aspects, such as the depth of re-spreading topsoil, the season when the soil handled and the timing of seeding, are also important. Seed will not survive if buried too deep, and it persists better when the soil is moved during the dry season. Also, plant establishment from seeding is greater when the seed is applied to a freshly disturbed surface. Together, the combined use of fresh topsoil return, seeding and planting of 'recalcitrant' (or resistant) plants have now resulted in numbers of plant species at 15 months of age equal to those recorded in equivalent-sized plots in unmined forest. For further information, see www.alcoa.com.au

Source: Good Practice Guidance for Mining and Biodiversity ICMM International Council on Mining & Metals 2006, Available from: ICMM, www. icmm.com, info@icmm.com

Siting of Industries: In order to help the concerned authorities and entrepreneurs, it is necessary to frame certain broad guidelines for siting an industry. It is also necessary to identify the parameters that should be taken into account while setting up an industry. With this in view, the following environmental guidelines are recommended for siting of Industries to ensure optimum use of natural and man-made resources in sustainable manner with minimal depletion, degradation and/or destruction of environment. These are in addition to those directives that are already in existence under the Industries (Development and Regulation) Act, 1951.

Areas to be Avoided: In siting industries, care should be taken to minimise the adverse impact of the industries on the immediate neighbourhood as well as distant places. Some of the natural life sustaining systems and some specific land uses are sensitive to industrial impacts because of the nature and extent of fragility. With a view to protecting such sensitive areas, industrial sites shall maintain the following distances from the areas listed below:

- **Ecologically and/or otherwise sensitive areas:** at least 25 km; depending on the geo-climatic conditions, the requisite distance hall have to be increased by the appropriate agency.
- **Coastal areas:** at least 1/2 km from High Tide Line.
- **Flood plain of the riverine systems:** at least 1/2 km from flood plain or modified flood plain affected by dam in the upstream or by flood control systems.
- **Transport/communication system:** at least 1/2 km from Highway and railway.
- **Major settlements (3,00,000 population):** distance from settlements is difficult to maintain because of urban sprawl. At the time of siting of the industry, if any major settlement's notified limit is within 50 kms, the spatial direction of growth of the settlement for at least a decade must be assessed and the industry shall be sited at least 25 km from the projected growth boundary of the settlement.

Note:
Ecological and/or otherwise sensitive areas include (i) Religious and Historic Places; (ii) Archaeological Monuments (e.g., identified zone around Taj Mahal); (iii) Scenic Areas; (iv) Hill Resorts; (v) Beach Resorts; (vi) Health Resorts; (vii) Coastal Areas rich in Coral, Mangroves, Breeding Grounds of Specific

Species; (viii) Estuaries rich in Mangroves, Breeding Ground of Specific Species; (ix) Gulf Areas; (x) Biosphere Reserves; (xi) National Parks and Sanctuaries; (xii) Natural Lakes, Swamps; (xiii) Seismic Zones; (xiv) Tribal Settlements; (xv) Areas of Scientific and Geological interest; (xvi) Defence Installations, specially those of security importance and sensitive to pollution; (xvii) Border Areas (International); and (xviii) Airports.

Siting Criteria: Economic and social factors are recognised and assessed while siting an industry. Environmental factors must be taken into consideration in industrial siting. Proximity of water sources, highway, major settlements, markets for products and raw material resources is desired for economy of production, but all the above listed systems must be away for environmental protection. Industries are, therefore, required to be sited, striking a balance between economic and environmental considerations. In such a selected site, the following factors must be recognised.

- No forest land shall be converted into non-forest activity for the sustenance of the industry (Ref: Forest Conservation Act, 1980).
- No prime agricultural land shall be converted into industrial site.
- Within the acquired site, the industry must locate itself at the lowest location to remain obscured from general sight.
- Land acquired shall be sufficiently large to provide space for appropriate treatment of waste water still left for treatment after maximum possible reuse and recycle. Reclaimed (treated) wastewater shall be used to raise green belt and to create water body for aesthetics, recreation and if possible, for aquaculture. The green belt shall be 1/2 km wide around the battery limit of the industry. For industry having odour problem, it shall be a kilometre wide.
- The green belt between two adjoining large scale industries shall be one kilometre.
- Enough space should be provided for storage of solid wastes, so that these could be available for possible reuse.
- Lay out and form of the industry that may come up in the area must conform to the landscape of the area without affecting the scenic features of that place.
- Associated township of the industry must be created at a space having physiographic barrier between the industry and the township.
- Each industry is required to maintain three Ambient Air Quality measuring stations within 120 degree angle between stations.

Rehabilitation of Mines: The concept of geological working plan was introduced by stopping mid slope mining. A detailed mapping of the limestone mine of M/s Hari Singh Thakur and Sons, District Sirmaur, was initiated and the lessee was directed to make an intervention of rehabilitation by lifting of undersize materials/screens lying along slopes and over approach roads and benches, to dress the benches properly, to erect retaining walls at the suggested sites, to spread the top soil in the mined out areas for plantation, to start mining from the top, to improve the gradient of the road and to raise the plantation all along the mine road. The intervention resulted in completion of rehabilitation of two benches, dumping of waste material at designated place, 25 check dams varying in length from 15 feet to 35 feet, raised at all vulnerable points to arrest the flow of debris to retaining walls, one of 187 ft long and another 80-ft have also been raised to channelise rainwater, afforestation work in the mined out bench and plantation of 19835 plants.

Conversion of the degraded and disfigured slopes of already mined out areas to a safe and stable condition at Khajjiar Khalla, district Sirmaur (Third Phase of NORAD Project): The setting up of demonstration site was done with an objective to convert the degraded and disfigured slopes of already mined out areas to a safe and stable condition and restore it as closely as possible to pre mining condition, by depicting various techniques of

rehabilitation at Khajjiar Khalla, district Sirmaur under NORAD Co- Operation Scheme.

The area of about three hectares in an operative mine since 1980 was selected because most of the mines are located nearby it. Eco restoration plan on the scale of 1:500 land leveling, scaping and fencing. Total length of breast wall and crate wire wall, etc. for stabilising approximately 1000 metres. More than 600 species of trees and many bushes were planted. Bakumbar, a limestone mine survived well in first year. After area was stabilised, Eucalyptus, Gul Mohar and Bamboo trees started growing well. This area attained almost pre mining condition in three years.

Another such initiative under Aus-Aid Project, the India-Australia Training and Capacity Building Project (IATCBP) was taken up with involvement of stakeholders in the rehabilitation programme. Three sites in Sirmaur district and three sites in Chamba district, having different types of problems as well as in another area of Himachal Pradesh were selected for different simple and low cost lessees. The Department successfully established all the above sites in this project.

Source: Environmental Management Capacity Building Technical Assistance Project. Activity 11- C: Demonstration Project (World Bank funded MoEF Project)

Bagan Dhar was selected as it is a ridge acting as a drainage divide where six mines are situated in the catchment area. A composite plan was made for Bagan Dhar catchment area because, initially, the programme was focused in individual lease areas only. The affected slope below the mines of Messrs Satya Tomer and Messrs Sohan Singh and Meet Singh was rehabilitated and the slope is stabilised with a growth of local bushes on it.

Source: Industries and Mining, page 493-495, State of Environment Report, Himachal Pradesh

4.6 Industry

Siting of industries: In order to help the concerned authorities and the entrepreneurs, it is necessary to frame certain broad guidelines for siting an industry. It is also necessary to identify the parameters that should be taken into account while setting up an industry. With this in view, the following environmental guidelines are recommended for siting of Industries to ensure optimum use of natural and man-made resources in a sustainable manner with minimal depletion, degradation and/or destruction of environment. These are in addition to those directives that are already in existence under the Industries (Development and Regulation) Act,1951.

Source: Environment Guidelines for Industries, Environment Impact Assessment Division MoEF, Government of India.

Areas to be avoided: In siting of industries, care should be taken to minimise the adverse impact of the industries on the immediate neighbourhood as well as distant places. Some of the natural life sustaining systems and some specific land uses are sensitive to industrial impacts because of the nature and extent of their fragility. With a view to protect them, industrial sites shall maintain the following distances from the areas listed below:

- Ecologically and/or otherwise sensitive areas: At least 25 kms; depending on the geo-climatic conditions, the requisite distance shall have to be increased by the appropriate agency.
- Coastal areas: At least 1/2 km from High Tide Line.
- Flood Plain of the Riverine Systems: At least 1/2 km from flood plain or modified flood plain affected by dam in the upstream or by flood control systems.
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Source: Environment Guidelines for Industries, Environment Impact Assessment Division MoEF, Government of India

Note:
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Siting Criteria: Economic and social factors are recognised and assessed while siting an industry. Environmental factors must be taken into consideration in industrial siting. Proximity of water sources, highway, major settlements, markets for products and raw material resources are desired for economy of production, but all the above listed systems must be away for environmental protection. Industries are, therefore, required to be sited, by striking a balance between economic and environmental considerations. In such a selected site, the following factors must be recognised.

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- The green belt between two adjoining large scale industries shall be one kilometre.
- Enough space should be provided for storage of solid wastes so that these could be available for possible reuse.
- Lay out and form of the industry that may come up in the area must conform to the landscape of the area without affecting the scenic features of that place.
- Associated township of the industry must be created at a space having physiographic barrier between the industry and the township.
- Each industry is required to maintain three Ambient Air Quality measuring stations within 120 degree angle between stations.
- No industry may be sited in any planning area of Himachal Pradesh for which Interim Development plans have been approved is in contravention to the Industrial Land Use as specified therein. In the Planning Area and Special Area for which Interim Development Plans or Development Plans are yet to be prepared, the industries shall be sited in consultation with the Town & Country Planning department.

Source: Environment Guidelines for Industries, Environment Impact Assessment Division MoEF, Government of India

Mitigation measures

Environment Management in Ambuja Cement Plant at Darlaghat: A glass bag house (GBH) has been installed for controlling emissions from the kiln and raw mill section,

the most polluting section in a cement factory. The Glass Bag House has an efficiency of 99.9 percent and maintains emissions even below 50 gm/Nm3. Electrostatic Precipitators (ESPs) have been installed at the clinker cooler and cement mill sections, while bag filters have been installed at the coal mill, cement mill and packing plant, for the control of emissions. The emissions from all the stacks are maintained at much below 100 mg/Nm3, as against the National Standards of 150 mg/Nm3 for the cement industry. Bag filters have also been installed at all material handling/loading/unloading points for the control of fugitive emissions. There is no solid waste generation and all the dust collected in the air-pollution control equipment is automatically recycled into the process.

Source: Environment Guidelines for Industries, Environment Impact Assessment Division MoEF, Government of India

Setting up of a Solid Waste Management Plant: A Solid Waste Management Plant has been set up at Village Majra, *Tehsil* Nalagarh, district Solan. UPL – Environmental Engineers Ltd. along with its parent companyM/s United Phosphorus Ltd. have formed special purpose vehicle viz. M/s Shivalik Solid Waste Management Company Ltd. for the execution of Solid Waste Management Project. First phase of the project is completed and Solid Waste Management Plant i.e. Treatment, Storage and Disposal Facility (TSDF) has started receiving hazardous waste from member industries in the State of Himachal Pradesh with effect from 20th June, 08 which will result in the protection of environment . of the State, which are, otherwise, harmful not only for human lives, but for the entire ecosystem and would affect whole environment.

Source: Environment Guidelines for Industries, Environment Impact Assessment Division MoEF, Government of India

Setting up of a Common Effluent Treatment Plant (CETP): To prevent the industrial effluents from polluting the local environment, a Common Effluent Treatment Plant (CETP) is being set up at Village Sheetalpur, *Tehsil* Nalagarh, district Solan. A Special Purpose Vehicle (SPV) viz.M/s Doon Infrastructure Ltd. has been incorporated for this purpose by the M/s Baddi-Barotiwala-Nalagarh Industries Association Ltd. A patch of land measuring 30.08 *bighas* is being leased out to M/s Doon Infrastructure Ltd. (SPV) for setting up this facility for a period of 50 years. A CETP is proposed to be set up under the Integrated Infrastructure Up-gradation Scheme (IIUS) of the Government of India with a cost of Rs. 185.00 *crores*. A detailed project report on this behalf has been sent to the Government of India for approval/sanction. Recently, Baddi Infrastructure Limited, a Special Purpose Vehicle of Baddi, Barotiwala and Nalagarh (BBN) Industries Association and Association of BBN Industrial Corridor, has proposed a CETP at Baddi for Baddi and Barotiwala areas.

Source: HP PCB Annual Administration Report, 2008-09

4.7 Energy

A number of good practices for the sector have been compiled based on documented State, National and International best practices and experiences. These best practices are summarised below:

Buffering water body/reservoir from human pressure and rejuvenation of natural process for wetland/water body/reservoir restoration: Conservation and restoration of water body/reservoir involves not only buffering water body/reservoir from direct human pressures, but also maintaining all other important natural processes, which are directly linked to supporting the water body/reservoir in maintaining the fragile ecosystem. Measures like controlling soil erosion, reducing pressure on water body/reservoir resources and, most importantly, changing the attitude of people in using wetlands, are important for conservation and restoration. Long term measures include creating buffer zones for water body/reservoir protection, limiting anthropogenic activities around the water body/reservoir and helping in reviving their natural functioning. The restoration programmes with an ecosystem approach helps in correcting Point and Non-point sources of pollution. This, along with

regulations and planning for wildlife habitats and fishes, helps in arresting the declining water quality and the reduction or loss of wetlands/water bodies/reservoirs.

An integrated approach to manage the wetlands is required where a conservation of following measures can be used to restore the water body/reservoir.

- Pollution abatement practices to reduce the non-point source of pollution through reduction at source and waste minimisation.
- Afforestation with native species in areas around the wetland/water body/reservoir to control the entry of silt from runoff.
- The shorelines of the lakes should be lined with bricks or stones in an attempt to control shoreline erosion.
- Creation of artificial wetlands/water bodies/reservoirs for the purposes of storm water management and pollutant removal from surface water flows.
- Infiltration trenches for reducing storm water sediment loads to downstream areas by temporarily storing the runoff.
- Rotation of crops rather than monocultures to reduce the need for Nitrogen and assistance with pest control and help in aeration of soil.
- Promoting public education programmes regarding proper use and disposal of agricultural hazardous waste materials and regular monitoring of wetlands/water bodies/reservoirs.
- Promoting recreational facilities and creating public conscience is essential part in prompting people, in general, to take initiatives for protecting wetlands.
- Rainwater harvesting is one of the key steps to be adopted in urban communities where most of the area is been metalled either by roads or by concrete buildings to improve the groundwater recharge, and thereby reduce the pressure on water body/reservoir to meet the urban water resources demands.
- Along with rain water harvesting, storm water management helps in reducing the pressure on water body/reservoir. In urban areas, rainwater is diverted to sewerage drain, where it becomes expensive to treat and use for any utilities. Investment can be made to have a separate drain for storm water to which the rainwater harvested in each and every individual unit is connected. It will be then cost effective to treat and use the same for non-potable water utilities in industries, for gardening and for other non-potable purposes.
- Prevention of silt is better than de-silting or dredging, which involves huge economic costs.
- Waste water, solid and semi solid waste entering into the lake from external sources must be stopped before any restoration work is implemented.

Source: Nanda Kumar, Wetland Conservation in India; need for effective legal framework. http://www.nlsenlw.org/environmental-protection/articles/wetland-conservation-in-india-need-effective legal-framework/sendto=form

Good practice on desilting/dredging: Unscientific desilting/dredging needs to be carefully carried out as turbidity caused by such activities adversely impacts aquatic flora and fauna. The need for dredging may be considered on merit on case to case basis, only in cases of wetlands impacted by siltation. For example in India, National Lake Conservation Plan recommends increasing the lake depth through de-siltation. It does have an impact on its flora and fauna and may lead to destruction of habitat. De-siltation must be supported by bathymetry of the lake as per the standard methodology and its planning and execution to be carried out scientifically under expert guidance.

Source: Guidelines for National Lake Conservation Plan, National River Conservation Directorate, MoEF, Government of India, 2008.

Good practice for bank stabilisation and re-vegetation of embankments to control erosion and siltation: Stabilisation of banks is needed to arrest the movement of fine silt

towards deep and open water areas. Plantation of shallow wetland/water body/reservoir with emergent macrophytes will provide habitat for nesting and to stabilise newly accumulated silt. Use of vegetated barrier towards periphery will control further movement of silt in the lake. Many geo textile products and agro-forestry technologies are available for stabilisation and revegetation of embankments to control erosion and siltation. Construction of check dam, check wall, toe wall, contour bunding, vegetative spurs and plantation are some of the demonstrated best practices to improve the continuous flow of clear water to the wetland/water body/reservoir. Embankment should be created in areas, where surface runoff is high and catchment is highly degraded, to stem siltation problem.

Source: Wetland management Planning: A Guide for Site Managers, WWF, IUCN, Wetlands International and Ramsar Bureau, 2008, Guidelines for National lake Conservation Plan, National River Conservation Directorate, MoEF, Government of India, 2008.

Usage of Soft engineering techniques v/s conventional concrete and steel techniques in soil stabilisation: Historically, concrete and steel were used as erosion control materials. Use of concrete and steel in the form of concrete structures and steel piling etc. is called **hard engineering**. It is imperative that any development effort should go hand in hand with ecological equilibrium so as to sustain it and return to natural living, which has been accepted as a safe way to solve many environmental problems. This method is called soft engineering. The ultimate objective of natural erosion control measures is to establish a dense network of root system and vegetative cover to the desired degree of growth in the shortest possible time. Slowing the flow of water down the slope accomplishes two things. The transport capacity of the thin sheet flow is reduced, thereby minimising the displacement of dislodged soil particles, and more rainfall infiltrates into the soil, providing desirable moisture to newly planted seedlings.

The materials used in soft engineering are woven and non-woven geo-textiles, geogrids, geomembranes and geocomposites. The majority of geo-synthetics, covering a wide range of woven and non-woven geo-textiles, geogrids, geomembranes and geocomposites used in civil engineering applications are polymeric. These products generally have a long life and do not undergo biological degradation, but are liable to create environmental problems in the long run. Throughout the world, growing awareness about sustainable development to preserve the environment has led to the rehabilitation of areas damaged either by natural or industrial causes. In effecting this, the use of biodegradable natural materials are gaining popularity. However, in absence of availability of natural material, these should be used as the control offered by these is much beneficial than other hard engineering methods. In recent years, coconut coir fibre due to its characteristics of degradability, moisture retention, tensile strength and adaptability has been found to be eminently suitable internationally for manufacturing products used in soft engineering for soil and water erosion control, stream bank stabilisation, wetland/water body/reservoir regeneration, river bank stabilisation, wasteland/water body/reservoir restoration, hill side slopes, road embankments, re-vegetation applications etc.

Source: Wetland Management Planning: A Guide for Site Managers, WWF, IUCN, Wetlands International and Ramsar Bureau, 2008, Guidelines for National lake Conservation Plan, National River Conservation Directorate, MoEF, Government of India, 2008.

Engineering works in respect of bund may be minimised with naturalisation of bund as a preferred option. The cost towards shaping/strengthening including slope revetment, provision for construction of retaining wall, if any, etc. should not exceed 10-15 percent of the total project cost. Stone revetment along the inner slope of the earthen bund has to be resorted to in cases where strengthening of bund is required. As far as possible, naturalisation of slopes by providing suitable vegetation with proper selection of species, should be resorted to.

The lake shores should be naturalised as far as possible by planting macrophytes on the lake

slope rather than providing hard stone pitching.

Source: Wetland Management Planning: A Guide for Site Managers, WWF, IUCN, Wetlands International and Ramsar Bureau, 2008, Guidelines for National Lake Conservation Plan, National River Conservation Directorate, MoEF, Government of India, 2008.

Development of legal Instrument to prevent land use change for water body/reservoir: Rapid unplanned growth of hill towns, construction activities without a proper plan, general non-compliance with prescribed norms and guidelines, and indiscriminate use of land for commercial outfits/tourist resorts have severely and adversely affected the fragile ecosystem of the Himalaya. Therefore, regulations for control on land use change (e.g., diversion of agricultural land for other purposes) and sale/purchase of land are urgently needed across the Indian Himalayan Region (IHR). Legal/policy initiatives taken by some State Governments could serve as a model to be promoted across the IHR after proper evaluation, e.g., Assam Hill Land and Ecological Sites Bill, 2006. The Assam Hill Land and Ecological Sites (Protection and Management) Bill, 2006 has been passed by the Assam Legislative Assembly to prevent indiscriminate cutting of hills and filling up of water bodies in urban areas, which had led to serious ecological problems in places, like Guwahati. Prior to this, many assembly members had expressed apprehension that the Bill would take away traditional settlers' rights over the hills. However, the State Government assured them that it is committed to granting land rights to those, who have been living on the hills for the past 15 years or more. It also promised a new land use policy for such settlers. Under the Bill, the State Government can bring any hill under its purview for protection.

Source: Governance for Sustaining Himalayan Ecosystem (G-SHE), Guidelines & Best Practices, Ministry of Environment & Forests, Government of India.

Legal intervention in Identification of Lake Boundary and prevention of encroachments: Legal instruments at local level, like Government Order and zonation

a. The State Government/Local assist in identification of lake boundaries and prevention of encroachment. For example, National Lake Conservation Plan prescribes a list of Do's:

   Administration has to take necessary steps for declaring the lake boundary through a Government Order. The lake boundary is to be decided in relation to the lake submergence area at its full tank level.

b. The local administration/local body has to take all necessary steps to ensure removal of encroachments, if any, in the lake submergence area/lake boundary.
c. The project proponents to consider for notifying the 'Establishment of a Bio-conservation Zone' around the water body for better safeguard of the lake surroundings from growing pollution potential and encroachment.

Source: Guidelines for National Lake Conservation Plan, National River Conservation Directorate, MoEF, Government of India, 2008.

Eco-design of Tourism Facility, Energy Conservation, Bio-Climatic Design and Alternative Energy Sources: This new approach should be based on the concept of *eco-design*, which may be defined as "any form of design that minimises negative environmental impacts by integrating itself into the surrounding ecosystem."

- Apply bio-climatic design criteria, which means understanding the physical setting of facility, the local climate, including prevailing winds, solar radiation, appropriate local materials, biodegradation, surrounding vegetation, etc.
- Consider the sun's positioning when choosing the orientation of tourism facility so as to maximise the use of natural light and trap incoming solar radiation to heat interior spaces, taking note that in the northern hemisphere, the sun is mainly shining from the south.

- To maximise 'solar window', the slope of the roof (in degrees) should be roughly equal to the latitude of the site.
- Analyse in each case, the convenience of applying solar energy for heating water and for generating electricity (photovoltaic systems), as well as other alternative, environmentally-friendly energy sources, such as wind power, biomass etc.
- Overhaul the entire lighting system by replacing candescent bulbs by CFLs.

Source: www.uneptie.org/tourism/bestprac.html, Integrating Biodiversity into the Tourism Sector / Best Practice Guideline; National Environment Commission, Royal Government of Bhutan August 2004/Environmental Code of Practice/Tourism Activities; Guide for Sustainable Tourism Best Practices.

Soil Conservation and Sediment Control Programmes: Soil and Water Conservation and Sediment control programmes are being increasingly adopted in many areas of the world. This component of human impact on the sediment loads of the world's rivers must be assuming increasing importance. Although the literature provides many examples of plot and small catchment experiments that clearly demonstrate the success of soil and water conservation measures and improved management practices in reducing local soil loss, there is currently limited quantitative evidence of the impact of such measures in reducing the sediment fluxes from larger river basins. Such evidence is now available for the loess region of the middle Yellow River basin in China, where extensive soil and water conservation and sediment control programmes have been implemented over the past thirty years. In this region, attention has been directed to both reducing downstream sediment loads and to on-site soil and water conservation in order to reduce reservoir sedimentation and to alleviate siltation problems, which cause serious problems for flood control along the course of the lower Yellow River.

Source: Boosheng et. al. Yellow River Basin Management and Current Issues, Journal of Geographical Sciences, Volume 14, Number 1, 29-37, DOI: 10.1007/BF02841104, Springerlink

Development of a common water resource management framework in a river basin: Development of an integrated water resource management framework in a river basin can lead to sustainable resource development while reducing negative impacts. Water Framework Directive concept has been tried and tested by different countries in Europe, which are part of the same river basin. Such concept can be applied among different Indian States, which are part of the same basin. The central concept of the Water Framework Directive is the concept of integration that is seen as key to the management of water protection within the river basin district. The key elements of this directive are as follows:

Integration of environmental objectives, combining quality, ecological and quantity objectives for protecting highly valuable aquatic ecosystems and ensuring a general good status of other waters; **Integration of all water resources**, combining fresh surface water and groundwater bodies, wetlands, coastal water resources at the river basin scale; **Integration of all water uses, functions and values** into a common policy framework, i.e., investigating water for the environment, water for health and human consumption, water for economic sectors, transport, leisure, water as a social good; **Integration of disciplines, analyses and expertise**, combining hydrology, hydraulics, ecology, chemistry, soil sciences, technology engineering and economics to assess current pressures and impacts on water resources and identify measures for achieving the environmental objectives of the directives in the most cost-effective manner; **Integration of water legislation into a common and coherent framework.** The requirements of some old water legislation (e.g., the Fish water Directive) have been reformulated in the Water Framework Directive to meet modern ecological thinking. After a transitional period, these old directives will be repealed. Other pieces of legislation (e.g., the Nitrates Directive and the Urban Wastewater Treatment Directive) must be co-ordinated in river basin management plans where they form the basis of the programmes of measures; **Integration**

of all significant management and ecological aspects relevant to sustainable river basin planning including those, which are beyond the scope of the Water Framework Directive, such as flood protection and prevention; **Integration of a wide range of measures, including pricing and economic and financial instruments, in a common management approach** for achieving the environmental objectives of the Directive. Programmes of measures are defined in **River Basin Management Plans** developed for each river basin district; **Integration of stakeholders and the civil society in decision making** by promoting transparency and information to the public, and by offering an unique opportunity for involving stakeholders in the development of river basin management plans; **Integration of different decision-making levels that influence water resources and water status**, be it local, regional or national, for an effective management of all waters; **Integration of water management from different Member States** for river basins shared by several countries, existing and/or future Member States of the European Union.

Source: Best Practices in River Basin Planning, Common Strategy on the Implementation of the Water Framework Directive, CSI - WFD - Project 2.9, May 2003.

Payment for Environmental Services – an approach to enhance water storage capacity:

Case Study 1: Kulekhani Hydropower Development

Payment for Environmental Services (PES) is an emerging paradigm in the management of environmental resources. Rather than Governments relying on regulatory instruments, such as prohibitions and standards, PES relies on adopting innovative mechanisms that are tied to incentives, and are flexible, voluntary, and contextualise the socioeconomic reality. The basic rationale of PES is to provide incentives and benefits to people agreeing to utilise ecosystems in ways that protect or enhance their environmental services for the benefit of the wider population.

PES for water storage: This case study examines the use of PES as a policy instrument in the Kulekhani watershed in central Nepal, and how it has played a role in enhancing the capacity of water storage.

Kulekhani Hydropower (Nepal): The Kulekhani watershed is located 50 km southwest of Kathmandu and is the source of water for the Kulekhani reservoir, which supplies water to hydropower plants downstream. The 92 MW Kulekhani hydropower plant is different from most hydropower plants in Nepal in that it relies entirely on monsoon rain collected in a reservoir rather than on rivers emerging from the Himalayas. As with similar reservoir systems, the plant was designed to supplement peak load in the drier seasons.

In 1973, Nepal generated 39 MW of electricity, of which 32 MW came from run-of-the-river (RoR) systems (Ghimere 2004). At this time, the demand for electricity was increasing by around four percent per year. The generating capacity of the RoR projects was nearly one-third less in the dry season. In 1980, the peak load requirement was 65 MW, indicating a need for an additional 40 to 60 MW by the mid 1980s. The 92 MW Kulekhani hydropower plant was commissioned by the Nepal Electricity Authority in 1982. The original gross capacity of the reservoir was 85.3 million cu.m, of which 73.3 million cu.m was live volume. The reservoir, designed with a life-span of 50 years, was expected to last 100 years (Sthapit 1996). However, the main problem for reservoir type hydropower plants in Nepal is sedimentation. Sediment loads in Nepal's watersheds are among the highest in the world; 85 percent of the runoff occurs during the monsoon yielding 98 percent of the sedimentation load (Mahmood 1987 in Sangroula 2006).

The Kulekhani watershed: The hydropower reservoir depends on the water from a 12,500 ha watershed with a mosaic of different land uses (Table). The watershed has 8000 households with over 45,000 residents, spread over eight Village Development Committees (VDCs) living in a subsistence economy based on (sloping land) agriculture and livestock rearing. Communities also manage forests to extract timber, fuel wood, fodder, and litter. The four monsoon months account for around 80 percent of the annual precipitation; this rain is the main source of water for agriculture. In general, there is a shortage of water during the remaining eight months.

Land use in the Kulekhani Watershed in 1991

Land use category	Area (ha)	%
Sloping terrace	4254	34.0%
Level terrace	237	1.9%

Valley terrace/fans/tars	713	5.7%
Forest	5455	43.6%
Shrub land	1147	9.2%
Grazing and grassland	200	1.6%
Barren land/rock	50	0.4%
Lakes	216	1.7%
Gullies/landslides	18	0.1%
Other	210	1.7%
Total	12,500	100%

Source: IWMP 1992 in Sthapit 1996

The Kulekhani watershed receives 1500 to 1700 mm of rainfall annually on average, but the rainfall is often uneven. In July 1993, the watershed received 542 mm over a 24-hour period with rainfall reaching 80 mm in an hour, causing a massive landslide, flooding and siltation. The plant required major repairs. Over 20 years of operation, the reservoir has lost more than 25% of its storage capacity due to siltation (Sangroula 2006).

The PES mechanism: With the rapid loss in capacity of the reservoir, the Government recognised that Kulekhani was a critical watershed of strategic importance and started programmes targeted at participatory conservation. More attention was paid to promoting proper land use management in the uplands to reduce siltation. Activities to promote watershed conservation included community forestry, conservation education, terrace improvement, and fruit plantations.

Various studies (e.g., Amatya 2004; Ghimere 2004) have shown that soil erosion from agricultural land is as much as 73 times higher than that from forested land. Analysis of land use patterns showed that forest cover in the watershed declined between 1978 and 1992, but it had recovered to earlier levels by 2001. An analysis of sedimentation patterns indicated that the rate of sedimentation in the Kulekhani Reservoir declined with the increase in forest cover and that the dry season water flow gradually increased (Upadhyaya 2005). Maintaining forest cover appeared to be an efficient way of reducing siltation. In 2003, in line with this, the Rewarding the Upland Poor for Environmental Services (RUPES) programme (WAC no date) started to work with upland communities in Kulekhani and the hydropower plant authorities to foster a win-win situation based on a PES mechanism (Upadhyaya 2005). The RUPES programme empowered local communities and organised them into a Watershed Conservation and Development Forum to promote the conservation of forested lands in the upland watershed to reduce siltation. The aim was for the electricity authority to finance the activities through a PES mechanism with the upland people living in the catchment area receiving a payment from the hydropower plant in return for the community managed forests they conserve.

RUPES was successful in establishing a payment mechanism channelled through the district development committee (DDC) based on the 1999 Local Self-Governance Act and the 1992 Decentralisation Act. The Nepal Electricity Authority pays the upland farmers for implementing the conservation activities via the Central Government, which allocates 12 percent of the royalties generated from the Kulekhani plant to Makwanpur DDC under the Environment Management Special Fund. Of this, 50 percent is allocated to the village development committees (VDCs) in Makwanpur District and the remainder to upland settlements (20 percent), downstream settlements (15 percent), and the VDCs that house the power plant, generator, dam, and reservoir (15 percent).

The Kulekhani case reflects the start of a paradigm shift in Nepal, with the Government taking action to introduce PES. So far, three annual payments have been made. The VDCs, together with other local bodies such as civil society groups, political parties, and NGOs, organise themselves to formulate a plan, which is discussed at village level meetings and then presented to the DDC for approval for financing according to the agreed allocation. The budget is in addition to the regular VDC budget and depends on the power generated from the plant. So far, much of the payment has been used by the local population for rural development work of immediate benefit, such as village electrification and road construction.

Source: Bhaskar Singh Karky, Sustainable Livelihoods and Poverty Reduction, ICIMOD, bkarky@icimod.org Laxman Joshi, ICRAF SE-Asia Regional Research Programme, L.JOSHI@CGIAR.ORG; Sustainable Mountain Development No. 56, ICIMOD, Winter 2009.

Best Practice for Governments for promoting Micro Hydro Development: Governments need to assign clear responsibilities for micro hydro development and the development of the necessary 'enabling environment'. Best Practice suggests that this would ideally be part of assigning more general responsibilities for the provision of decentralised energy services to rural (or marginalised); Governments need to treat all energy supply options equally ('offer the full

menu of options') and to favour what best meets the needs of the consumer in different locations; Governments need to ensure fair competition between competing supply options and provide equal access to aid and other concessional funds, subsidies, tax breaks and support; Plans for the expansion of the electricity grid should be rule based and in the public domain to reduce the uncertainty about when the grid will reach a particular location. Clear rules should be published regarding the actions the grid supplier must make to compensate micro hydro owners when the grid arrives (either to buy out the plant at written down costs or to buy the hydro electricity produced); While Government finance tends to favour large scale energy investments (in say power or fossil fuels), micro hydropower has the opportunity of utilising local capital (even the creation of capital through direct labour to build civil works) and it is part of the new trend towards 'distributed' power with much reduced costs of transmission.

Source: Best practices for sustainable development of micro hydro power in developing countries, Department for International Development, UK and The World Bank, March 2000

Examples of successful mitigation measures for hydropower development, Agavanzal, Spain: In the river Tera, fisheries were significant before the Agavanzal project was implemented. The fisheries declined drastically after construction, mainly due to eutrophication and less oxygen content in the water. Creation of a fishery reserve for trout and fish re-stocking were tried as mitigation measures.

Okumino, Japan: In the Okumino Pumped Storage Project in Japan, an increased turbidity and eutrophication of the water was mitigated by constructing a by-pass waterway to prevent the long-term persistence of turbid water.

Takami, Japan: Drainage from construction work was studied in this project for two years. Conclusion: As expected, increasing contamination of the water was observed during the construction period, but was then decreasing and coming back to normal levels when the construction work ended.

Valparaiso, Spain: In the Valparaiso Project in Spain, the problem of lower oxygen content in the downstream water was mitigated by a system of air injection in the turbine, by an aeration weir that was constructed downstream and by the operation of valves. However, the mitigation measures for improving the content of dissolved oxygen in turbinated water were adopted as a consequence of an incident of fish mortality not previously foreseen.

Kokkosniva, Finland: The headwater level was lowered by one metre from the preliminary plan in the Kokkosniva Project in Finland to save the Suvarto village from being flooded.

Kurotani, Japan: Severe sedimentation problems in the Kurotani Project in Japan were not expected, but later on documented. A rubber weir in the main river for automatic sediment flushing was constructed, and this mitigation measure has been shown to be successful.

Okumino, Japan: In the Okumino Project in Japan, endangered species and protected areas were involved in the development of daily pump storage. All technical facilities were constructed underground so as not to affect rare plants.

Hunderfossen, Norway: Environmentally, the most attention in this project was given to expected changes in fish population and migratory habits. The dam became an effective barrier to migratory and spawning trout. The fish ladder constructed to mitigate this problem was unsuccessful as the reduced river flow below the dam limited fish migration. Even fish restocking (trout) turned out to be less successful than expected. An increase in the minimum flow downstream at certain times to trigger migration improved the situation.

Resettlement: Involuntary resettlement of people has often been considered to be the most problematic impact following the construction of dams and establishment of

reservoirs in populated areas. Some examples from the database may illustrate this:

Project Number of resettled people - Batang Ai, Malaysia 3,600; Robert-Bourassa, Québec, Canada 2,400; Great Ruaha, Tanzania 1,011; La Remolina-Riano, Spain 900. The most common ways of mitigating or compensating this impact as reported in the database are e.g.:- New employment (Batang Ai, Robert-Bourassa); Lump sum of payment (Batang Ai, Great Ruaha, Kurkiaska, La Remolina-Riano, Lokka, Porttipahta); New housing (Batang Ai, Robert-Bourassa); New (agricultural) land (Batang Ai, Kurkiaska, La Remolina-Riano, Lokka, Porttipahta).

Source: Hydropower and the Environment: Survey of the environmental and social impacts and the effectiveness of mitigation measures in hydropower development, IEA Technical Report, Volume 1

Sustainable Hydropower Development Programme includes integration of a number of initiatives/sub-programmes: An integrated basin wise approach consisting of a number of sub-programmes can lead to Sustainable Hydropower Development. It has been demonstrated by Mekong River Commission. Since 2007, interest in the potential for hydropower development in the lower part of the basin has escalated. Many new proposals to develop hydropower schemes are being advanced by Mekong Governments and the Private Sector, both on the tributaries; and more recently, a revival of interest on the mainstream, on the Lao, Lao-Thai and Cambodian reaches of the Mekong mainstream. Hydropower brings with it several concerns regarding the potential for impact on the environment, fisheries and people's livelihoods. These concerns need to be balanced with the economic and poverty alleviation priorities of the Mekong River Commission (MRC) Member Countries. The MRC is working with Mekong Governments to develop coordinated and integrated impact assessments, consistent and fair mitigation measures, and hydropower development strategies and policies. The Initiative on Sustainable Hydropower (ISH) was formulated in Development in 2008 and endorsed by the MRC Joint Committee in March 2009. The Initiative is coordinated across many of MRC's programmes and includes a range of activities, for example:

Studies on fish migration, the barrier effect of dams to fish migration and potential mitigation measures by the Fisheries Programme.

A collaborative venture with the Asian Development Bank and World Wide Fund for Nature to develop a hydropower sustainability assessment tool under the Environment Programme. Designing specifications for the design of standard navigation locks with the Navigation Programme.

Providing a basin-wide integrated water resources management strategy within which individual project proposals can be assessed under the Basin Development Plan.

Capacity building within MRC Bodies, line-agencies and other stakeholder groups under Integrated Capacity Building Programme, and

Stepped-up dialogue with developers, line agencies and regulators to share multi-disciplinary data, applied research analysis and other outputs that are available from all MRC Programmes on ongoing basis.

Source: http://www.mrcmekong.org/ish/ish.htm

Cascading Hydropower Development based on Environmental/Ecological Flows: The uniform dispatching mechanism is being used for planning the cascade power station development on the basis of linkages of various power stations with river section's river ecological/environmental protection requirements based on environmental flows. This planning approach not only reduces environmental impacts, but also optimises hydropower operation plan. The above said approach is being adopted in majority of European countries and in Asia, e.g., Dadu river valley hydropower development and Gansu Heihe hydropower development in China

Source: http://www.adb.org/Documents/Environment/PRC/39652-PRC-SEIA.pdf

Examples of successful demonstration of grid/off grid renewable energy usage in India: Agro-Waste and Industrial Waste Utilising Gasifier: The 8MW Biomass based Power Project with export of 7.2 MW of

surplus power after meeting 0.80 MW for in-house auxiliary consumption has been set up at Patancheru in Medak District of Andhra Pradesh. The project utilises a variety of agricultural wastes and industrial wastes for generation of power, such as sugar cane trash, coffee shells, toor dal stalks, corn cobs, ground nut shells, poultry manure, jowar husk, waste crops, juliflora, eucalyptus, cotton stalks, saw dust, wood husk, rice husk and bagasse. The project was commissioned in February 2002. A Plant Load Factor (PLF) of 90 percent has been achieved in the first full year of commercial operation. The technology used is totally indigenous.

A rooftop grid-interactive Solar Photovoltic (SPV) power system can meet the partial load during peak demand of a building and supply grid-quality power to the utility when power is not required on holidays. A typical grid-interactive system comprises SPV modules, which supply electrical power to the load through a high-quality inverter. The inverter converts the direct current (DC) generated by SPV to grid-quality alternating current (AC). When the SPV system produces more power than is needed in the load area, the excess power can be sold to the utility. During 2001-02 five projects with an aggregate capacity of 275 kWp were commissioned. This brings the total rooftop systems installed up to February 2002 to nine. In addition, two rooftop systems are under installation. Among the projects commissioned during the year are those at the Vidyut Saudha Building in Hyderabad and at the Bikalp Shakti Bhavan in Kolkata.

World's Largest Solar Steam Cooking System at Tirumala, Andhra Pradesh: The world's largest solar steam cooking system has been installed by the Tirumala Tirupathi Devasthanam (TTD) at Tirumala in Andhra Pradesh. The system has a capacity to prepare food for 15,000 people/day and employs automatic tracking solar dish concentrators, which convert water into high pressure steam. The steam thus generated is being used for cooking purposes in the kitchen of TTD. It has been hooked up with the existing boiler working on diesel, so as to make the system reliable under all climatic conditions. The system has been designed to generate over 4000 kgs of steam/day at 180 degree centigrade and 10 kg/sq cm, which is sufficient to cook two meals for around 15,000 persons. It is modular in nature and consists of 106 automatic tracked parabolic concentrators arranged in series and parallel combination, each of 9.2 sq metre reflector area. Each unit of concentrators is connected to a central steam pipeline going to the kitchen. The system is made of indigenous components and the reflectors are of acrylic mirrors having reflectivity of over 75 percent. Its installation was completed during September 2002 and was inaugurated on 11th October 2002. The system is expected to save around 1,18,000 litres of diesel per year, valued at Rs. 2.3 million.

Source: Renewable Energy in India Programmes and Case Studies, Indian Association for the Advancement of Science, ISECO Science and Technology Vision, Volume 1 - May 2005 (61-64)

4.8 Market Infrastructure

Agriculture Produce Market Committee (APMC) market with complete infrastructure development and rail/road connectivity: A well planned APMC market with complete road and rail connectivity can make it an agricultural/horticultural produce hub of the region. This has been demonstrated by APMC market in Vashi in New Mumbai area in Maharashtra. The growing population of Navi Mumbai as well as that of Mumbai city needed a centralised facility for marketing of upcountry agricultural produce, food grains, vegetables, fruits and milk products within the cities. Therefore a centralised wholesale market, APMC was established and commissioned in Vashi in 1993 to cater to the needs of Mumbai and Navi Mumbai. Grains, rice, wheat, fruits, oil, vegetables etc. are available in APMC. This is the biggest and cheapest agricultural produce market of the twin cities. The shops are arranged categorically. There are four markets in the APMC, namely – Phase-I, Market-I - Onion and Potato Market.; Phase-I, Market-II - Fruit and vegetable market; Phase-II, Market-I - Commodity market and Phase-II, Market-II -

Grains, rice and oilseed market. It is developed on a 160 hectare area and handles 4000 trucks per day. In addition, cold storages for milk, meat and animal products serve to facilitate both local and international trade. Though it is a wholesale market, the general public also purchases various items in bulk from here. APMC is, in fact, the place where agricultural produce are brought from different parts of the country and distributed to the twin cities and surrounding regions. An association of APMC called Grain, Rice and Oilseeds Merchants Association (GROMA) also exists. The APMC project won the Prime Minister's award in the Implemented Urban Planning and Design Project category. As huge numbers of commercial vehicles are needed to bring in and move out the produce, their orderly parking, etc. is very essential. A truck terminal of 8.5 hectare has been provided for this purpose in the APMC area. In addition, for the commodities and produce that are moved by rail, a Railway Goods Yard of 18 hectare has also been made available to facilitate easy and orderly movement of the goods. These facilities have put Navi Mumbai commerce in forefront and have made it the agricultural produce hub of Mumbai city.
Source: http://www.msamb.com/english/apmc/apmcs/

Planning for Developing APMC market, an example of Agricultural Produce Market Committee (APMC), Surat: APMC in Surat was established in the year 1951 and commenced functioning in 1952 by making the provisions under 'The Gujrat Agricultural Produce Market Act, 1963 and Rules 1965' in order to facilitate the sale of agricultural produce. One of the biggest markets in Gujarat for vegetables, the market is spread over a notified area of 1, 30,511 square kms catering to the entire Surat city including Choryasi *taluka* and 110 villages therein, and handles the regulated commodities including green leafy vegetables, ginger, chillies, raw mangoes, turmeric, onion, tomatoes, sweet potato, groundnut, lemon, all types of flowers, fruits (orange, custard apple, banana, sapota, strawberry, pomegranate, papaya etc.). The market has recorded the total arrivals of 694396 MT with a value of Rs 700.19 *crores* during 2009-10. Approximately, 6000-10000 people come daily for trading purpose in the market.

The current Fruit and Vegetable Markets in the region are facing several constraints, such as inadequate sales space area, vehicular congestion, produce sold in the open leading to spoilage/wastage, non transparent price discovery mechanism, inadequacy of storage facilities, inadequacy of parking provisions, un-graded produce etc. In addition to these, with changing consumption patterns and increasing health consciousness of the consumers, the per capita consumption of horticultural produce is increasing in the State and this is expected to increase the demand for the same in the region. In view to overcome the above difficulties and yield other benefits like being a catalyst for growth of horticulture in Southern Gujarat, APMC Surat intends to develop state of art Type A Modern Wholesale Market Complex at Choryasi taluka, Surat with 26 collection centres identified at potential catchment areas under National Horticulture Mission as a Greenfield project in an area of 51 hectares. The Government of India has identified Surat district as an Agri Export Zone (AEZ) for Mangoes and Vegetables. Complementary to this identification, the Government has also taken steps to put Surat on the map of domestic airline network and the airport facilities in Surat city are being put to use. The proposed market will have agro and food processing units meant for export, thus, catering to the export demand and, in turn, providing remunerative prices to the farmers.

The expected throughput of the market has been estimated at 1925 MT per day, which is expected to reach 2500 MT per day in the next five years and would handle commodities including fruits, vegetables, flowers, aromatics, herbs, spices and condiments. Core Market Infrastructure will include refer vans, digital weighing scales, loading and unloading infrastructure, parking facility for vehicles, fruit and vegetable halls, sorting, grading, washing and parking facilities, pre-cooling units, cold storages and temperature controlled

warehouses, ripening chambers, quality testing facilities, material handling equipments, electronic auction halls, price displays, future trading facilities, waste disposal system, etc. These, along with the non-market infrastructures, such as Hotels, Business centres, Catering Services, General Retail Shops, Banks, Institutes, Farmers' Training Centres, Restaurants, etc. and essential infrastructure and services to be provided in the market and Collection Centres would be in conformity with any recognised national/international standards. The benchmarking of the existing technologies and processes against state-of-art technologies and global best practices will facilitate seamless marketing of the horticultural produce. The allotment of necessary land at village Abhava, *taluka* Choryasi, district Surat is awaited from the Government of Gujarat. At present, APMC management has decided to start construction of non-market infrastructure at the existing land owned by the APMC, Surat at Sahara Darwaja, Ring Road, Surat. The Construction is under progress.

Source: www.apmcsurat.org

Electronic Auction System (EAS) to conduct auctions in APMC Market can improve operational efficiency: EAS not only improves operational efficiency, but also fetches better prices for farmers. This has been demonstrated in Bangalore. Electronic Auction Systems are sophisticated solutions to address the growing need for an efficient trading method. EAS employs various electronic hardware and software sub-systems. These sub systems work in conjunction to produce a seamless mechanism for conducting auctions. EAS provides buyers with a standardised user interface that is easy to understand and use. Electronic Auction Systems are easy to manage and can generate an exhaustive database of buyers, sellers and their requirements for the organisation conducting the auctions. There are three independent auction processes that are offered by the EAS. Of these three auction systems, each has its advantages and disadvantages. The three auction processes offered by the EAS are Dutch Auction, English Auction and Combi-Auction.

The Dutch auction is the most popular method of auctioning commodities, such as flowers, fruits and vegetables. The Dutch auction is also known as the 'Reverse auction'. The auction begins at a high price (higher than the market price). The current price is displayed in figures as also represented on a giant circular dial with 100 segments. The Auction commences and the price indicated starts to fall at a steady speed (determined by the auction master). Buyers present in the hall can observe this falling price on the clock dial. When an interested buyer observes that the clock has reached a price at which he is interested to buy, he presses the 'bid' button on his bidding terminal (or table) to stop the clock. Immediately, the telephone hand set on the table is activated and the buyer may then speak to the auction master informing him of the quantity he wishes to purchase. Once the allotment is complete, the current price on the clock dial is increased by a fixed amount (usually 20-30 segments). The price displayed on the clock dial then begins to drop once again, until the next buyer pushes the button or the end price is reached. The Dutch auction is very quick and efficient for price discovery and multiple lot auctions. Dutch auctions currently deployed in Holland are able to operate at speeds of up to 1500 auctions per hour.

The English auction is a more traditional type of auction and is ideally suited for auctioning of non-perishable commodities. English auctions generally generate higher prices for commodities, but take longer to run. Due to their slower nature of operations, English auctions are usually used to auction larger lot sizes. The English auction begins with the floor price being displayed on the clock. The auction begins and the buyers are given a fixed time of 10 seconds (can be changed by auction master) to place their bids. A two-digit countdown display shows the time remaining before the auction closes. Interested buyers place their bids by pressing the bid button on the bidding terminal (or table). Each press of the bid button pushes up the current price displayed on the clock by a fixed amount. This

increment value is displayed on each user's bidding terminal and is fixed by the auction master during the lot preparation process. Each time a bid is received, the identity of the buyer is displayed on the clock and the countdown display resets to set value (e.g. 10 seconds). The auction ends when no more bids are received and the countdown reaches '00'. The successful bidder is the one, who bids last and whose ID appears on the clock. The successful bidder is required to purchase the entire lot put for auction.

The combination auction (Combi-Auction) is a recent innovation pioneered by M/s Techno-Magica, Bangalore. It harnesses the strengths of the Dutch and English auction processes. The quick price discovery technique of the Dutch auction along with the higher price realisation achieved by the English auction result in a more efficient and profitable auction. In the Combi-auction, the process begins like a standard Dutch auction with a fall in price. Once an interested buyer strikes the price, the auction changes to the English Auction Method. There upon, a countdown clock keeps the auction open allowing any interested buyer to push up the price by pressing his bid button. It has been found that due to the competitive nature of the English auction, it is possible that the price is pushed up marginally from the discovered price. This results in higher earnings for the producer (farmer). The EAS architecture consists of two significant building blocks: Software and Hardware. The EAS system incorporates complex software to perform various tasks.

Source: Detailed Project Report on Development of Modern Terminal Market for Fruits & Vegetable at Chandigarh, NLAM, Jaipur

Modernisation of wholesale markets/new markets: An example of Safal market in Karnataka: The existing market structure of fruits and vegetables does not adequately address the complex problems of farmers. It has low marketing efficiency, high post harvest losses and does not foster competitiveness. A modern innovative system that can reduce the vested interests of a large intermediary chain, create competition, assure quality and modernise operations with IT applications in handling of fruits and vegetables, is necessary to raise the income of actual farmers. To achieve this objective, National Dairy Development Board was asked to develop and establish operations for a Modern Integrated Terminal Market for Fruits, Vegetables and Flowers in Bangalore by the Government of India. The market is popularly known as Safal Fruit and Vegetable Auction Market (SFVAM). SFVAM was a special endeavour to bring farmers and wholesalers to a common platform to facilitate information sharing and to promote the spirit of cooperative movement. The State Government amended the Karnataka State Agricultural Produce Marketing (Regulation) Act, 1966, to pave the way for National Dairy Development Board to own, operate and manage fruit and vegetable auction market in the State. The venture facilitates the organisation of more than 200 horticultural farmers' associations with around 50,000 grower members for planned and assured production and supply of agricultural produce for the purpose of wholesale marketing. The Safal market was designed on the lines of European Auction Markets. It offers a clean and hygienic market environment. Components of the marketing system include establishment of Wholesale Auction Market, Backward Linkages with Farmers, and Forward Linkages with the Retailers and Consumers. The market is designed to handle 1600 MT tonnes of fresh fruits and vegetables per day, operating 312 days in a year.

Source: Detailed Project Report on Development of Modern Terminal Market for Fruits & Vegetable at Chandigarh, NLAM, Jaipur

Information & Communication Technology (ICT) interventions in APMC market: In developing countries, farmers generally do not have access to information about the value of their crops and depend on intermediaries to facilitate the selling of their produce at markets. Inadequate market price information among farmers creates information asymmetries that reduce their bargaining power, especially with middlemen, who facilitate the sales. This leads to lower prices for their produce. Having access to

actionable information, i.e., timely and accurate market price information, can allow farmers to make relevant and timely livelihood decisions throughout the entire agricultural value chain process. Projects to address market information asymmetries in the developing world are being conducted via a variety of ICT related projects. Some of these are donor driven or Government sponsored pilots, while others are Private Sector led initiatives (in large part, but not limited to telecommunication companies introducing value added services). In Africa, projects such as Kenya Agricultural Commodity Exchange (KACE), TradeNet in Ghana, Malawi Agricultural Commodity Exchange (MACE) in Malawi, Manobi in Senegal and South Africa are some examples that attempt to address these inefficiencies through a variety of ICT driven mechanisms that reduce information asymmetries and/or allow them to engage in online exchanges. In South Asia, numerous ICT interventions intended to reduce information asymmetries and subsequently provide alternate markets and exchanges for farmers exist. In South Asia, as in the rest of the developing world, the media used to deliver such services vary from Internet (Aquachoupal, e-Choupal, e-Krishi etc.) to radio to mobile (GGS, Agriwatch, Warana Unwired, e-Krishi). Amongst these, India's e-Choupal initiative implemented by ITC in 2000 was one of the first and most well known. E-Choupal has facilitated the generation of more stable incomes by allowing farmers to improve their decision making ability on optimal harvesting time for their produce. In India, dissemination of market price information has been demonstrated via the e-Choupal initiative which improved the efficiency of rural markets (in this case that of the market for soybeans in the State of Madhya Pradesh in India) by increasing the competitiveness of buyers. The reduction in transaction costs meant that the prices received by producers were higher. Furthermore, the reduction in intra and inter market price volatility has given farmers a more stable income stream with positive livelihood benefits. The current ground reality with respect to ICT utilisation is such that access and connectivity in the developing world is primarily driven by mobile phones, as opposed to Personal Computers based telecentres. Research has showed how just the expansion of mobile coverage in Niger resulted in the reduction of price volatility in the country-wide grain market.

Source: Sriganesh Lokanathan & Harsha de Silva, Leveraging Mobile 2.0 in India for Agricultural Market Access, March 2010, Mobile 2.0 project of LIRNEasia, IDRC/DFID

Awareness/APMC market Information dissemination through mobile telephony: Some examples.

Indian Farmers Fertilizers Co-operative Limited (IFFCO) Kisan Sanchar Ltd.: Mobile operator Bharti Airtel partnered with IFFCO to form a joint venture company in 2008 to provide five free daily voice updates on *mandi* prices, farming techniques (including dairy as well as animal husbandry), weather forecasts, rural health initiatives and fertiliser availability, etc. mainly targeting the 55 million farmers, who are members of IFFCO. 48,000 farmers had already subscribed to this service by May 2008, mostly from Uttar Pradesh. As of date of this report, they are now active in the States of Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Rajasthan, Uttaranchal, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu and West Bengal. Airtel currently reports having signed-on 1.5 million subscribers for this service from these 18 States. The service is marketed as part of specialised mobile tariff package only on Airtel's network with an IFFCO Kisan branded SIM card.

***Mandi* on Mobile:** BSNL, the National State owned Telecommunications Company and OnMobile, a Private Sector VAS provider partnered with the Uttar Pradesh Agricultural Marketing Board (*Mandi Parishad*) in late 2008 to start a service called '*Mandi* on Mobile'. The service allowed BSNL subscribers to call a number and receive current market prices of about 108 commodities from all the 247 *mandis* in the State. The completely voice-based solution (which even accepted voice commands) allowed farmers to just enter the commodity and the district and they would get

current taluka-wise *mandi* rates for the chosen commodity in the specified district. The project was started as pilot project and to date hasn't expanded beyond the State, even though Bharti has since then partnered with others to start a similar pilot in other States.

BSNL and National Fertilizer Limited (NFL): The still unnamed service was started in early 2010 in a tie-up between BSNL and National Fertilizer Limited. The tie-up was primarily to recharge vouchers for BSNL mobile customers through the distribution network of NFL. In addition, the vouchers would allow subscribers to get a free SMS or voicemail five times daily with the *mandi* prices, soil testing, farming techniques, dairy and weather forecasts in the local language of the region of the subscriber. This service is initially being offered only in the States of Madhya Pradesh and Chhattisgarh, where NFL has a large market share for its product base.

Krishak Bharti Co-operative Limited (KRIBHCO) Reliance Kisan Ltd.: Reliance Telecommunications and Krishak Bharati Cooperative Limited (KRIBHCO), a fertiliser producing cooperative, formed a joint venture in June 2009, called KRIBHCO Reliance Kisan Ltd. This joint venture was again primarily a rural distribution model for telecom and non-telecom products. In structure, this is similar to the IFFCO Kisan Sanchar Ltd's service. However, desk research has revealed limited information on the nature of the Value Added Services (VAS) targeting market price dissemination via this system. Reliance did, in late 2009, announce a full suite of upcoming VAS targeting mGov services in Maharashtra and Kerala, which would include market price information as well.

***Mandi Bhav*:** Tata Teleservices (TTSL) partnered with Impetus Technologies to launch *Mandi Bhav* as a VAS targeting rural farmers. Via this service, subscribers on the Tata Indicom network can get real-time spot market prices on 500 commodities from over 3,000 *mandis* across India. Launched in early 2009, the service was initially available in Hindi, Marathi and English in the State of Punjab. Since then, it has expanded into Haryana, Himachal Pradesh, Uttar Pradesh and Maharashtra and is to be available in up to nine languages. The service costs INR 30/month. Service delivery is via WAP, SMS or via a downloadable application that runs on the phone.

Source: Sriganesh Lokanathan & Harsha de Silva, Leveraging Mobile 2.0 in India for Agricultural Market Access, March 2010, Mobile 2.0 project of LIRNEasia, IDRC/DFID

Combination of supply chain management, electronic spot exchange and Private Sector participation for storage can improve efficiency in market operations: A case study of Kaidi, Ahmedabad, Gujrat: Located 65 km (almost an hour's travel) from Ahmadabad, Kadi is well known for cotton production as well as castor seed production. A pilot project was launched by Institute for Financial Management Research (IFMR), where different players were brought together to bring efficiency in market operations. Agricultural Terminal Markets Network Enterprises (ATMNE) is a supply chain company that is a part of IFMR Trust funded by its Network Enterprises Fund (NEF), which is managed by Institute for Financial Management Research Ventures. NEF was the main investment vehicle for IFMR's projects in closing identified gaps in rural supply chains including rural tourism, dairy, crafts, apparel and furnishings, rural energy, vocational training, rural drinking water, consumer goods (FMCG) and agriculture terminal markets. Agricultural Terminal Markets Network Enterprises purview is solely over agricultural terminal markets. While the pilot project involves several IFMR Trust entities working in collaboration, ATMNE serves as the main interface to the farmers for this pilot. Their activities in the Kadi pilot include advertising the services to farmers at the grassroots level as well as registering farmers to access services provided by Agricultural Terminal Markets Network Enterprises. Agricultural Terminal Markets Network Enterprises staff appreciated that farmers engrained in traditional growing and selling practices were cautious of new methods as well as of outside 'advice' originating from a non-Governmental actor. Farmers used to selling their produce to the

same known traders at the APMC *mandi*, were initially wary of trusting a new buyer, let alone understanding the concept of 'commodity backed financing'. This meant that Agricultural Terminal Markets Network Enterprises personnel had to (and continue to) expend considerable effort to build awareness and trust amongst the farmers by frequently visiting and liaising with them to understand their problems. In particular, they make considerable efforts to educate farmers on the functioning of the electronic exchange as well as the financial concepts behind commodity-backed financing and how the farmers can leverage the exchange and these financial instruments for improved livelihoods. Often, they establish good relationships with village elders and opinion makers. Positive word-of-mouth-references by early adopters have helped the Agricultural Terminal Markets Network Enterprises team build creditability with other farmers. Agricultural Terminal Markets Network Enterprises is an institutional member of National Spot Exchange Limited (NSEL), which allows them to trade on National Spot Exchange Limited platforms. They thus serve as an intermediary to the farmers, selling commodities on their behalf on the National Spot Exchange Limited platform. They provided instant cash settlements to farmers, who sell their crops, as well as loan facilities (financed by IFMR Capital) to those, who avail of their commodity backed loan facilities.

National Spot Exchange Limited (NSEL) is an electronic spot trading exchange, which was started in 2008. Currently operating in seven States, they provide delivery based spot trading for 17 commodities. Members of NSEL are allowed to trade on their platform and all trades are guaranteed by the exchange with trading parties insured against credit risk and counter-party defaults. NSEL provides customised solutions based on commodity and location and brings together relevant parties, where needed to handle the entire supply chain. For example, they were the ones who brought in NK Industries into this pilot as well as arranging warehousing facilities. In Kadi, they operate out of the premises of NK Industries and have an Internet enabled computer through which ATMNE can access and conduct trades on the exchange on behalf of the farmers. As per the terms of its service, NSEL guarantees the quality of the traded castor seeds as well as the quantity and, if the farmer avails of it, the safe storage of his commodity in the warehouse, which is also located on the same premises. Warehousing is outsourced by NSEL to an external company called Sohan Lal & Company.

NK Industries (formerly NK Oil Mills) is major exporter of castor oil and its derivatives. They are a vertically integrated firm engaged in the manufacture of castor oil (crushing, processing, refining and extraction of derivatives) as well as marketing and exporting. Its Kadi manufacturing plant is about 1.5 km from the main APMC *mandi* and houses computing facilities for famers to access the NSEL trading platform. Personnel from both ATMNE as well as NSEL are placed within the premises to help respectively with sale of the produce and trade on the platform.

ATMNE operates a branch office in Dharampur, which is one of the five *talukas* of the Valsad district in Gujarat. The branch office was set up to cover the Dharampur area as well as four surrounding areas of Karda, Varkhadia, Maharajpura and Vadharoda (village). The Dharampur office is about 55 km from Kadi. This branch office acts as the focal point in recruiting and educating farmers. The Dharampur staff actively engages with farmers to popularise their service as well as to encourage them to come to the Dharampur office to register them to access the ATMNE services. When a farmer comes to register at the Dharampur office, he brings a proof of identity (usually an election card) and proof of address. Those who own the land on which they farm also bring their land records. The farmer's digital photo as well as digital thumbprint are then taken and encoded into a smart card (FINO card) that is issued to the farmer. The FINO card then serves as a biometric identification card of the farmer and provides him access to current as well as potential future services that ATMNE might

provide. During the registration process, staff also conducts a detailed farmer's household profile, which is later verified by a visit to the farm. All these details are entered into ATMNE's Customer Management System (CMS). In addition, farmers coming to the Dharampur office can see the average daily price being offered for castor seeds at the APMC *mandi* as well as at the NSEL price on a price board outside the Dharampur office. The NK Industries processing plant serves as the trading hub and houses the ATMNE office, NSEL's trading platform as well as the warehouse. By the time the farmer comes to the NSEL hub, he already has an idea of the average price at the APMC *mandi* that day. There is generally low intra-day volatility in the APMC *mandi's* average price of castor seed. Even though the *mandi* is open from 10am to 5pm daily, the daily supply, and hence the average price (due to low intra-day volatility) of castor seed is generally known by 11 am. The farmers sometimes visit the APMC hub (which is 1.5 km away from the NSEL hub) prior to coming to the hub. But most often, the farmers who sell at the NSEL hub have already obtained APMC prices through their mobiles by either calling the ATMNE staff or by calling other farmers/traders at the *mandi*.

The first activity, as soon as he enters the NSEL hub, is to have his produce weighed. Castor seeds are generally transported and sold in gunny bags each weighing approximately 75 kgs when filled with castor seeds. Depending on the quantity, a variety of modes of transport are used. When the commodity is brought in a van or truck, the entire vehicle is first weighed on an electronic weighbridge. After quality inspection and unloading, the vehicle is again weighed and the weight of the vehicle is subtracted from the original weight to determine the weight of the commodity. In the event when the farmer brings the produce in small quantities, then each bag is weighed on a smaller electronic weighing scale after unloading. The farmers then proceed to get the Quality Certification (QC), which certifies the quality standard of the commodity. The quoted price on NSEL is for a specific optimal quality standard (up to five percent moisture and oil content of 44-48 percent). When the farmer comes to get his quality certification, both moisture and oil content are tested from a sample of each bag. A 4.2 litre square container filled with the castor seed sample is used to test the sample. The sample is then checked for weight as well as foreign matter, such as dust, stone and damaged seeds. Foreign matter content is gauged by sieving the sample through a 4x4 mm sieve. Based on these measurements, deductions are calculated for the price per 20 Kgs based on a standardised and transparent deduction chart. All this information is then encoded on the QC, which is issued to the farmer at the conclusion of the quality testing process. Armed with the Quality Certificate, he then proceeds to the NSEL platform, where he can check the price being offered that day for a specific quality standard. NSEL then offers the farmer a price based on the quality standard of the castor seeds the farmer has brought. At this point, the farmer makes the decision to either sell the produce straight away or to utilise the commodity backed financing offered by ATMNE. The farmer's decision to sell or store is based on two factors (in decreasing order of importance):

1. His current cash requirements, if any;
2. His assessment of the future price trends and the value of his crop.

Should he decide to sell immediately, ATMNE as a member of NSEL, trades the farmer's commodity on the platform. NSEL clears all transactions only at the end of the day and payment is made only the following morning. However, ATMNE reimburses the farmer the full value of his traded crop immediately following the trade. Unlike the *mandi,* where farmers have to sell in lots of multiple bags, here the farmer is able to sell as little as one bag of castor seeds. Should the farmer decide to store his commodities, he then deposits his commodity at the warehouse and is issued a warehouse receipt against his produce. The storage rent is Rs. 0.15 per day per bag. He then hands over the warehouse receipt to ATMNE, which immediately pays the farmer 70 percent of the value of the commodity as per the current price available on the NSEL

exchange. ATMNE charges an annual rate of 10 percent for the commodity backed loan.
Source: Sriganesh Lokanathan & Harsha de Silva, Leveraging Mobile 2.0 in India for Agricultural Market Access, March 2010, Mobile 2.0 project of LIRNEasia, IDRC/DFID

Regulatory interventions to support market infrastructure: The Legislative Assembly of Mizoram passed the Mizoram Organic Farming Act, 2004 on 12.07.2004, to introduce, adopt areas for, promote and regulate organic farming in consonance with the National Organic Programme. The aims, among others, include:

- To notify areas of organic farming and to undertake such farming in such areas;
- To encourage the development of organic farming on private land and organic processing through various measures as may be prescribed;
- To facilitate certification of organic products in the State in conformity to the National Standards for organic products;
- To facilitate marketing of organic products in the local, national and international markets;
- To make infra-structure for organic farming including permitted inputs or material easily available to the intending farmers.

Source: The Mizoram Organic Farming Act, 2004; Act No 6 of 2004, passed on 12.07.2004

4.9 Rural Planning

Transfer of Backward Region Grant Fund (BRGF) Funds through Rapid Telegraphic Transfer (RTTF) of Funds in Madhya Pradesh: The State of Madhya Pradesh has received sanction of all the 24 district plans and the funds for the year 2007-08 amounting to Rs. 365.56 *crores*. Out of that, Rs. 322.41 *crores* for development plans and Rs. 2.40 *crores* for project preparation amounting to Rs. 324.81 *crores* have been released by the State. The State Government has opened about 13660 accounts in various bank branches through the nodal bank 'Central Bank of India' and the entire amount of Rs. 324.81 *crores* has been transferred to 13660 bank accounts as per year 07-08 approved plans of BRGF for *Zila Panchayats*, *Janpad Panchayats*, *Gram Panchayats* and the District Urban Development Authority (DUDA) at the district level. This has been an outstanding and very successful experiment in Madhya Pradesh. The *Panchayat* and Rural Development Department of the State have emailed the list of approved works for year 07- 08 to respective PRIs and have instructed CEO *Janpad* to hold meetings of Gram Panchayat *Sarpanchs* to apprise them about transfer of money through RTTF and to provide list of approved works to every *Gram Panchayat*, so that these works may start immediately. Also, at the *Janpad* and *Gram Panchayat* levels, the total funds for year 07-08 approved plans have been transferred and 10 to 20 percent deductions have been made in Zila Parishad and District Urban Development Authority (DUDA) funds. These deductions will be given to them after the balance amount is received from Ministry of Panchayati Raj, Government of India.

The State has transferred about 57 percent funds to the *Gram Panchayats*, 19 percent of funds to Zila Parishads (ZPs), 12 percent to *Janpads* and 12 percent to District Urban Development Authority (DUDA). The Panchayati Raj Institutions will fix up the agencies and technical support will be provided by Rural Engineering Services (for issue of TS and Layouts for GPs). So far, the system is functioning smoothly and it is hoped that it will run smoothly in future too. The State is now planning to put up Management Information System and Quality Control mechanisms in place by taking help from the very successful Rashtriya Sama Vikas Yojna (RSVY) implementation programme.
Source: http://panchayat.nic.in/brgf

Women Create History! Village Made Open Defecation Free in Two Days in Hoori, (Kinnaur District), Himachal Pradesh: A remote high altitude village called Hoori, *Gram Panchayat* (GP) Yangpa of Nichar block in district Kinnaur of Himachal Pradesh is now a clean village. All the 33 households of the village are using toilets and no one defecates in the open. Outsiders, who visited the village, could easily sense that the villagers treat sanitation as a public good. If visitors ask

villagers pointing to a household toilet in the village (which is located close to the pathway and is where the village begins): "Whose toilet is this?" People usually reply, "It belongs to everyone who needs to relieve himself/herself. In our village, anyone can use any one else's toilets, if required."

There is a rule made by the Village Sanitation Committee (which has mostly women members) that everyone, including wage labourers, has to use a toilet at all times, when there is a need to defecate. There is also a penalty/fine (ranging between Rs 500 to Rs 1,000 depending upon whether it is the first mistake or a repeated default) for defecating in the open. Outside labourers, whenever they arrive, are told by the village committee members to first construct a dry pit toilet for themselves and then to do anything else. Cow dung and street sweeping are disposed off in allotted places, such as agreed place for community littering, in agriculture fields. Everyone has imbibed improved hygiene practices, such as hand washing with soap and water after defecation, which was earlier almost missing. Hoori village is now neat and clean and everybody in the village is proud of this achievement. This was initiated and completed in two days during a five-day training workshop organised by the District Rural Development Agency, Kinnaur to train *Panchayat* Secretaries and *Panchayat Sahayaks*. This practice of always using toilets for defecation by all the inhabitants of the village as also the migrant labourers (as a rule now labourers construct dry pit toilet for themselves and use them), sweeping village lane and streets at regular intervals by women and younger people and use of improved hygienic practices were witnessed only after triggering an intervention by a group of participants, who went there for testing this approach in a real life situation as part of a training activity in October 2007. During the triggering exercise, all the community members present at the meeting were engaged in a self analysis of the village's sanitation profile using a number of participatory exercises such as transect walk, disease transmission routes and calculation of medical expenses etc. The exercise revealed that despite 60 percent households having toilets in their houses (most of them were defunct or were being used for bathing), 95 percent of village population was practicing open defecation. As mentioned above, the triggering team used participatory tools to ignite the community by helping them in analysing and reflecting on their own sanitation profile. The villagers realised the related negative effects of their sanitation behaviour on their dignity and health. While most community members present during the exercise became silent, two women community members, Rajvanti and Vijaylakshmi, said that everyone needs to stop open defecation as early as they could, as they don't want to eat human shit anymore. Surprisingly, after two days of triggering, these two women as the village's Natural Leaders (NLs), along with another NL Rameshwar, participated in the workshop and shared that they have made their village open defecation free and invited the participants to see their village's transformation. A team of participants, including the Project Officer, District Rural Development Agency, visited the village. During the visit, villagers welcomed them and said that "You people opened our eyes; earlier we were living like animals; we felt very much ashamed on that day." The then Project Officer also encouraged villagers by praising them for their work and requested them to motivate people in other villages in the neighbourhood, including their relatives in the area. The villagers shared that they had a meeting the same evening after the triggering team had gone back, and started constructing simple pit toilets with local material and using proper pit cover on it. Initially, they completed five toilets in different localities of the village and started sharing them and everyone stopped defecating in the open. After five or six months, all the households constructed pour flush toilets, including the initial five households that had constructed simple pit toilets. It was their upward journey on the sanitation ladder.

There is community participation in mobilising and sustaining the change. Women's group and some village youth, who were motivated by

women, took the initiative to improve the village environment. *Mahila Mandal* (women group) of Hoori also got a cash prize for mobilising and sustaining the sanitation gain under State sponsored '*Mahila Protsahan Yojana*' for promoting sanitation in Himachal Pradesh. Women and youth took interest in this; now women are monitoring that no one defecates in the open including migrant labourers. This practice is sustainable; women and a village committee ensure cleanliness in village lanes and monitor labourers' behaviour. This practice has been sustainable since the past two years. As mentioned above, there is a provision of imposing fine on defaulters; there has been no instance of default though. In 2009, the Gram Panchayat Yangpa has applied for Nirmal Gram Puraskar. This practice of triggering is replicated in many villages across Himachal Pradesh. Reportedly, district Kinnaur is on the verge of declaring itself an Open Defecation Free (ODF) district using community-led approach. The approach has also been successfully used in some other Districts/States/Countries. However, in most cases, triggering alone is not sufficient. Timely and strategic post-triggering follow-ups are critical in capitalising upon the desire of collective behaviour change and converting it into collective local action.

Source:http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_Compendium_India.pdf

Community Mobilisation Leads to Open Defecation Free Status in Three Months in Neen (Shimla), Himachal Pradesh

***Gram Panchayat*-level best practice:** In this case, training and orientation led to community mobilisation. Neen *Gram Panchayat* (GP) of Basantpur Block of Shimla district in Himachal Pradesh is the first Gram Panchayat to receive the State-level sanitation award for achieving fully sanitised status. Since March 28, 2007, when all the eight villages of the Gram Panchayat declared themselves Open Defecation Free (ODF), no one now defecates in the open and visitors are also not allowed to defecate in the open. Efforts have moved beyond safe disposal of human excreta to solid and liquid waste management. All the households are now making either vermi-compost from cow dung and household waste or using simple composting methods. Soak pits have been constructed for grey water wherever required. The people are also doing rainwater harvesting to combat water scarcity for toilets and bathrooms (around 60 percent households have constructed roof-top rainwater harvesting structures in their houses). There is excellent drinking water management at traditional water sources and household level. Improved water, sanitation and hygiene (WASH) facilities in the high school are managed by the school sanitation club. Women's groups organise sanitation drives every month to ensure overall cleanliness of the village. A *dhaba* (hotel) owner manages and ensures, on a voluntary basis, water for the pour flush community toilet in the local market for visitors.

Sustainability of improved behaviour is ensured by a village-level sanitation committee by involving children and women in the sanitation-related activities and monitoring. The Gram Panchayat imposes a penalty of Rs 50 for open defecators and people, who litter solid waste in the open. The demonstrated success of this practice has led to its replication in other Gram Panchayats of other blocks and districts in Himachal Pradesh. People come from outside the State to learn how the Gram Panchayat has achieved and is sustaining a fully sanitised status.

This integrated approach was initiated in January 2007. Although the Total Sanitation Campaign (TSC) was implemented in the GP since January 2006 (after the formation of the new Gram Panchayat (GP) elected in December 2005), out of 241 households, less than half of households (41 percent) had access to toilets. Only 10 percent toilets were in use for the purpose they were constructed and the remaining were put to alternative uses, such as bathing enclosures, storehouse, etc. TSC progress on the ground was not satisfactory until December 2006. A support organisation hired by the district authorities (Their services were terminated later, as the district administration found them ineffective) was working for community mobilisation.

In January 2007, *Panchayat* Secretary, Mr Bhagwant, under the guidance of the local Block Development Officer (BDO), formed two teams under the leadership of a *Zila Parishad* (ZP) member and the secretary himself (he had received training in Community-Led Total Sanitation or CLTS). They organised triggering sessions initially at two locations (in Neen ward and in Jubbar ward). Later, triggering sessions were organised in the other three wards. Door-to-door campaigns were undertaken by the natural leaders that emerged during the process. Later, members of all community-based women's groups (such as Gita of *Mahila Mandal*) took the lead, followed by block development committee, school children, teachers, other trained personnel and the district administration, who supported this initiative.

This effort witnessed good response from community members, particularly women and children. Then, the triggering teams planned to involve leaders of community-based women's organisations and school children as part of triggering teams. Follow-up sessions were organised for small groups of women by both triggering teams. The focus was on collective realisation of linkages between sanitation behaviour and health, and initiating local action without waiting for outside help. The Block Development Officer (BDO) also accompanied the team on some follow-up sessions to encourage those villagers, who took initiatives to modify their traditional behaviour.

The initial two *Mahila Mandals* soon triggered the remaining five. These women Self-Help Groups and school children visited the difficult/stubborn households, who were unwilling to change, in teams and motivated them as and when required. The Gram Panchayat also displayed newspaper cuttings related to sanitation achievement of other districts (such as good work of Killing Gram Panchayat of Mandi etc) on its notice board to break the myth that eradicating open defecation is difficult. During discussions with visitors and in official meetings at the Gram Panchayatoffice, the members made people realise their dignity. To scale up sanitation in the entire Gram Panchayat area, the GPWSC passed a resolution in a special *Gram Sabha* to make all the Gram Panchayat area Open Defecation Free (ODF) by March 31, 2007. Community members were mobilised by using multiple local community mobilisation tools, such as, mapping faecal-oral route, anecdotal stories related to sanitation, H2S vial and medical expenses, a *kala jatha* (street play) performance, and so on. Children formed sanitation clubs in the high school to ensure proper operation and maintenance of WASH facilities in schools. A weekly sanitation talk in the morning assembly of schools (including the high school and five primary schools) is now a regular feature in Neen Gram Panchayat. Initially, there was non-cooperation from retired Government employees of the Gram Panchayat. They perceived the involvement of women in TSC activities as wastage of time. Gradually, however, they realised that people changed their sanitation behaviour due to the efforts of women. They came fully on board, when they saw that the Gram Panchayat got the first position at block level competition of sanitation. Now, all sections and age groups of the community practice safe sanitation. Women's groups and *Panchayat* bodies are the main drivers in the Gram Panchayat. For example, the *Mahila Mandal* of Katheru hamlet (30 households, and no one had toilets initially) in Neen village undertook an initiative to change the practice of open defecation after a triggering session in January 2007. The *Mandal* members continued follow-ups in their own hamlet and triggering in village/ward of Neen until they became Open Defecation Free. They also did follow-ups in other villages of Gram Panchayat on demand. As stated above, initially, only two Mahila Mandals came forward to promote sanitation, but now all the seven MMs have undertaken the responsibility. These women groups have helped in mobilising unwilling Government employees, who were not cooperating in the campaign and not building or using toilets. School children, teachers and *Panchayati Raj* Institution (PRI) members also worked hard until the fully sanitised status was achieved. Villagers and Gram Panchayat members encouraged poor households of their village to construct toilets

with self-help. This modified practice is sustainable and is in operation since March 2007. Sustainability is ensured by involving the real stakeholders, such as school children, women's groups, village water and sanitation committee members and PRIs in monitoring and encouraging people towards improvement in sanitation facilities, especially because their villages are role models for other villages. Defaulters of sanitation rules have to pay a fine (Rs 50) in the Gram Sabha. Mahila Mandals (MMs)and Self Help Groups (SHGs) meet every month as part of group activity and also supervise cleanliness of the village paths and surrounding areas by involving other willing community members. A local *dhaba* (hotel) owner has taken the responsibility of ensuring water for the community toilet.

A new community toilet complex is under construction. Wall painting and slogan writing depicting the best hygiene and sanitation behaviour, and life cycle of different types of garbage and their possible reuse and safe disposal – have been done by the Gram Panchayat at strategic places in the villages and local markets to remind visitors and villagers about safe sanitation. This best practice is being replicated in other Gram Panchayats of the blocks and districts and in Himachal Pradesh. People outside the State visit the Gram Panchayat to learn these best practices. These visits also encourage them to ensure sustainability of changed behaviour in respect of sanitation. The people of Neen are sustaining their status after having been conferred the first cleanest Gram Panchayat reward of Rs 10 *lakhs* under State reward scheme of the Government of Himachal Pradesh in 2007.

Source:http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_Compendium_India.pdf

Case Study 1: Sanitation Success Stories in Fatehpur (Block Una, District Una), Himachal Pradesh

Background: Fatehpur is one of the first *Gram Panchayats* (GPs) of Una district to have won awards under the *Nirmal Gram Puraskar* (NGP) programme of the Government of India, as well as the *'Maharishi Valmiki Sampoorna Swachata'* award of the Government of Himachal Pradesh. The awards have beengiven in recognition of its achievements in attaining open defecation free status, ensuring complete toilet access and use in the households, schools and Anganwadis; and developing and maintaining proper solid and liquid waste management systems, with clean and green environment around the village. The key attributes of this remarkable success have been a well defined process, effective implementation and monitoring; and, above all, collective commitment – all of which have put Fatehpur on the road towards total sanitation.

Elements of Success: The key elements of the commitment, processes and systems that contributed towards Fatehpur's success are:

- Initiation of planning process based on situation analysis, which revealed that despite having access to toilets (164 out of 190 households had access), a majority of them werepracticing open defecation resulting in filth and dirt in and around the village and spread of diseases.
- The findings of the situation analysis helped in fine-tuning the strategies from construction driven to behaviour change approach, which saw massive investment in generating awareness using various communication tools, such as street plays, community meetings, audio-visuals, wall writing, posters, etc. Household-level meetings with individuals and families also played a critical role. The partnership approach adopted saw the involvement of youth clubs, women's groups and self help groups (SHGs) in mobilising the community to adopt sanitary behaviour. In particular, youth were mobilised and motivated for the upkeep and maintenance of religious places, schools, Anganwadis, sports grounds, etc. Teachers and students too have participated in this initiative with great impact. The key messages of mobilisation weredignity and health of women and Panchayat.

- Setting up a robust institutional mechanism to implement and monitor the total sanitation initiative by creating sanitation committees both at Gram Panchayat and ward levels. These committees were provided technical assistance by engaging support organisations of the district administration.
- The enabling role of district and block administration with support of line Departments, such as rural development, education, public health and others, have contributed tremendously to the success of the total sanitation drive in Fatehpur.
- Regular monitoring by Gram Panchayat, block and district officials has ensured sustainable behaviour change.

Source:http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_Compendium_India.pdf

Case Study 2: Sanitation Success Stories in Sain ke Sere (Block Nahan, District Sirmaur), Himachal Pradesh

Background: Sain ke Sere Gram Panchayat, with 256 households distributed in five wards of Sirmaur district has shown remarkable progress in achieving the goals of total sanitation within a very short time. The *'Maharishi Valmiki Sampoorna Swachata'* award of the Government of Himachal Pradesh, won by the *Panchayat* in 2008 at the block level, is a reflection of its commitment and hard work. Later, this helped the Gram Panchayat in winning the Nirmal Gram Puraskar in the same year.

Elements of Success: This successful initiative has hinged upon four very critical components:

- Realistic goal setting by the stakeholders has helped in bringing clarity, commitment and resources to set up the initiative in the *Panchayat*.
- Social mobilisation structured within the community-led total sanitation approach using triggering tools has played a particularly key role in changing the behaviour of the community – an approach adopted by the district administration to scale up the sanitation programme within the district. The implementation of the social mobilisation approach had a very systematic process flow, starting with the initial sensitisation of the Panchayat president, ward members and Panchayat secretary, followed up with community triggering processes and mass awareness programmes using '*kala jathas*', etc.
- Learning from experience has been one of the key processes that was adopted to understand the bottlenecks in changing sanitary behaviour, which was still favouring open defecation, especially in the absence of motivation and participation from its key stakeholders, like *Panchayat* functionaries, youth and women's groups, SHGs etc. Realising this, intensive mobilising was done under the leadership of the *Panchayat* president and supported by other officials to promote sanitation and hygiene.
- Monitoring of the progress by the ward members was one of the highlights that ensured sustained adoption as well as usage of the toilet facilities.

Source:http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_Compendium_India.pdf

Case Study 3: Sanitation Success Stories in Shamra (Block Sangdah, District Sirmaur), Himachal Pradesh

"Do not follow others. Make your own way and let the others follow." This saying felicitates Shamra Gram Panchayat that has set an example in the sanitation programme through its remarkable achievements by winning the *'Maharishi Valmiki Sampoorna Swachata'* award at the block and district levels as well as receiving the NGP in 2008. With these achievements, it has forced others to follow in their footsteps. For example, some Gram Panchayats, like Chokar and Sangraha, have replicated the lessons learnt during the implementation of Shamra's initiatives and reaped huge benefits in achieving total sanitation outcomes.

Elements of Success

The key elements of success have been:

- Commitment to practice was one of the key drivers for sustaining the demand creation drive. This was initially doubted by the community, but the persistent effort of Community-Led Total Sanitation trained motivators at the block level changed the perception of the Community and, later, their behaviour towards sanitation. The support and hard work of natural leaders within the community further strengthened the resolve; as a result, within three-four months (April to July 2007), the entire GP was declared open defecation free.
- Effective programming was another key factor, especially for setting up sanitation committees for implementation and monitoring at *Panchayat* and ward levels, supporting poor families in constructing toilets, etc.
- To ensure sustainability in gains made in sanitation; the *Panchayat* has also worked on issues of solid and liquid waste management in terms of providing dustbins, bio-gas, composting pits, systems of rain water harvesting, etc. and to maintain cleanliness and open defecation free status, it has also introduced penalties on individuals, if violating the status.
- Community-based monitoring was another important factor that helped the Panchayat to ensure greater sustainability of gains made. This was effectively supported by children and women's groups, who were engaged to monitor the facilities within the schools and community, respectively.

Source:http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP_Compendium_India.pdf

Watershed Management in States of Indian Himalayan Region: In the small hilly degraded watersheds in the outer Himalaya of Doon Valley, construction of gully plugs and plantations (Sahastradhara and Nalotanala watersheds) resulted in reduction of peak rates of runoff and increased base flow, the latter released as lean flow, which is used as a perennial irrigation source.

Interventions carried out for SWAJAL Phase I project under Catchment Area Protection (CAP) programme in 165 villages in

Uttarakhand also reported increase in the discharge of various springs after completion of the CAP work. Besides this, several other success stories have been reported from different parts of Uttarakhand where work has been carried out by villagers; examples include Gad Kharak (Ufrainkhal) and Dugar Gad in Pauri area in Uttarakhand.

The Government of Mizoram through the Accelerated Rural Water Supply Programme (ARWSP) and Technology Mission Programme has provided as many as 5,993 rainwater tanks in individual houses of 198 villages at a cost of Rs 60 million; individual households are expected to carry out the maintenance.

Spring sanctuary development using biological and physical measures to treat the catchment area is also underway in Sikkim.

Source: Governance for Sustaining Himalayan Ecosystem (G-SHE): Guidelines and Best Practices, Ministry of Environment & Forests, Government of India, G.B. Pant Institute of Himalayan Environment & Development

Supportive Policy and Measures by States for Energy Generation and Conservation: Uttarakhand has implemented a Policy for harnessing renewable energy sources with the Private Sector/community participation, which targets power generation as well as power conservation. Power generation can be done by individuals, *Gram Panchayats*, Registered Societies, and Private Companies. State Government has also launched a scheme for BPL families by providing assistance in procuring primary infrastructure, such as stove and cylinder for use of Liquefied Petrolium Gas (LPG).

Himachal Pradesh and Sikkim Governments have a policy to allocate additional quota of clean fuels (Liquefied Petrolium Gas, kerosene) to residents of hilly areas and tour operators, respectively in order to prevent deforestation. Biomass-to-energy and small hydropower plants need to be encouraged in the mountain areas to meet the energy needs. Provision of LPG as a clean cooking fuel in appropriately sized cylinders should also be considered to reduce pressure on the forests.

Source: Governance for Sustaining Himalayan Ecosystem (G-SHE): Guidelines and Best Practices, Ministry of Environment & Forests, Government of India, G.B. Pant Institute of Himalayan Environment & Development

Conservation area management through community involvement

Provision of entry fees for local community development:

- Allow community access to such areas for collection of fallen wood/litter and controlled collection of forest products including economically important wild plants.
- Use of forest produce for value addition, like use of pine needles for making of bio-briquettes.
- Develop opportunities for employment of local communities for area conservation and nature interpretation through proper training
- Promote initiatives of value addition in traditional technology/knowledge, such as handicraft, fermented food/beverages, apiculture and cattle breeding to upgrade the income of local inhabitants.

Ecologically safer roads – green roads: It is often argued that roads bring development by providing much needed connectivity and accessibility. As such, the road sector has been given high priority under the Government's *Pradhan Mantri Grameen Sarak Yojana* (PMGSY) to ensure connectivity to each village having a population of 250 or more in the hills. The present techniques used for hill road construction are often damaging to the sensitive Himalayan ecosystem. Therefore, there is an urgent need for developing guidelines and bye-laws to promote the Green Roads concept in the IHR. The Rural Roads initiative in Nepal is a good example of the successful implementation of this concept in the Himalaya.

Case Study 4: The broad guidelines for the Green Roads sector in the Indian Himalayan Region

For construction of any road in the Himalayan region of more than five km (including extension/widening of existing roads) length, where the same may not be tarred roads and environmental impact assessment is otherwise not required, environmental impact assessment should be carried out in accordance with the instructions to be issued for this purpose

by the State Governments.
• Provision should be made in the design of the road for treatment of hill slope instabilities resulting from road cutting, cross drainage works and culverts using bio-engineering and other appropriate techniques by including the cost of such measures in the cost estimate of the proposed road.
• Provisions should also be made for disposal of debris from construction sites in appropriate manner at suitable and identified locations so as not to affect the ecology of the area adversely; further, the dumped material should be treated using bio-engineering and other appropriate techniques and the cost of such measures should be included in the cost estimate of the proposed road.
• Wherever hot mix plants are used, they should be set up at least two km away from settlements and a minimum area of 200 sq. m. surrounding the site should be devoid of vegetation.
• No stone quarrying should be carried out without proper management and treatment plan including rehabilitation plan and financial provision for rehabilitation of the site should be included in the cost of the management plan.
• All hill roads should be provided with adequate number of road side drains and these drains shall be kept free from blockage for runoff disposal; in the event that this is not done and this fact leads to damages that could otherwise have been prevented, the persons responsible should be liable for prosecution/damages; further, the cross drains shall be treated suitably using bio-engineering and other appropriate technologies so as to minimise slope instability.
• The runoff from the road side drains should be connected with the natural drainage system in the area.
• Fault zones and historically land slide prone zones should be avoided during alignment of a road, where for any reason it is not possible to do so, notice should be given providing full justification and the construction should be carried out only after sufficient measures have been taken to minimise the associated risks.
• Notice should be given about all fault zones and land slide zones along the roads indicating the beginning and the end of such areas.
• Ridge alignment should be preferred to valley alignment.
• Alignment should be selected so as to minimise loss of vegetal cover.
• South or South-west alignment should be preferred to avoid moist areas.
• Appropriate design standards should be followed while designing the roads including mass balancing of cut and fill and avoidance of unnecessary cutting.
• Encouragement should be provided for use of debris material for local development.
Source: Governance for Sustaining Himalayan Ecosystem (G-SHE): Guidelines and Best Practices, Ministry of Environment & Forests, Government of India, G.B. Pant Institute of Himalayan Environment & Development

Cost-Effective and Appropriate Sanitation Systems: Sulabh International Social Service Organisation, India: India has a population of 1. 21 Billion, where the urban centres account for 27 percent of the population and cover an area of 3.3 million sq. km. 85 percent of the population, i.e., over 750 million people practised open-air defecation and use of bucket latrines resulting in health and environmental hazards. Sulabh International (NGO) initiated a cost-effective sanitation system in 1970. It converts dry/bucket privies to sanitary toilets, supplies toilets to houses where no latrines existed before, provides well designed and maintained community facilities, trains and rehabilitates scavengers to find other jobs and generates bio-gas from public toilets for energy generation. Sulabh International has also forged close co-ordination and partnership with the Government, local authorities and the communities involved.

Results include one million toilets and 4000 'pay & use' community toilets serving more than 11 million people daily, liberating 40,000 'scavengers'. 240 towns have been made scavenger free. Due to this success, State and Local Governments have started to implement the sanitation programme all over the country. Finding that affordable and sustainable technology is available and that institutional capacity has been built to train 'scavengers', the Government of India has passed legislation to ban 'scavenging' in the country. The programme is being replicated in South Africa, Sri Lanka, Nepal, Bhutan, Tanzania and Kenya. The project's impact on health, sanitation as well as on a socially excluded groups; high level of replicability of the technologies and the partnership between various sectors has been recognised by various environmental agencies.
Source: http://www.bestpractices.org/bpbriefs/social_services.html

Emaus Bidadosa - Employment of the socially excluded, Spain: The Emaus Bidadosa project is located in the Bidasoa Area of the Basque Country of Spain with a population of 53,312. Prior to the inception of the project in October 1997, ADEBISA

(Bidasoa Area Development Agency) had contacted, with no success, 150 enterprises of the area with the intention of getting employment for the people of the Horizon programmes in a subsidised manner, despite the fact that people had been trained to acquire relevant skills. Through collaborative and partnership structures involving social, economical and public actors, living conditions have improved through the employment of the most needy people, who had no other means of livelihood (homeless, women with dependant relatives, unemployed older persons over forty five years of age, former drug addicts). The programme has supported enterprises that are geared towards poverty alleviation. Through a participatory action plan, domestic waste has been managed and, in the process, employed people to separate and recycle the waste. The initiative demonstrates the importance of long-term planning in order to effectively address the issues raised by all parties involved. The practice has been replicated within Bidasoa as 'Corte Verde Patchwork Bidasoa', which recycles textiles to make patchwork clothing.

Source: http://www.bestpractices.org/bpbriefs/social_services.html

Improving the quality of life for socially excluded children, Kolkata, India: In Kolkata, more than a 100,000 children living in streets, red light areas, slums were left unattended and stayed away from schools. These vulnerable children were involved in menial labour, exposed to sexual exploitation and never had access to formal education. The purpose of the Educational Initiative is to enrol all out-of-school children (in the age group (5-14 years) into local formal schools (Government Sponsored/Municipal Corporation Schools/Private run Boarding Schools). Priorities include protecting children in vulnerable situations through support by providing them with shelter, protection, care and counselling with the involvement of Railway authorities, Police and the local public. Stakeholder participation comprised community representation in planning, implementation and sustainability by forming apex committees with representation from Youth Club members, community volunteers, ward councillors and parent-teacher committees. The initiative has not only reached out to 15,000 deprived urban children, but has been able to enrol 8,000 children into formal schools, while reuniting them with their respective families.

The initiative also aims to sustain the effort of the social reintegration of children through local resource mobilisation and community participation to create a sustainable environment for the children to be retained in schools. Community based preparatory centres, coaching centres and residential camps for children living in slums and squatter settlements, help ensure that children remain in schools, away from forced labour.

Over the years, Children In Need Institute (CINI ASHA) has created a model in the field of education by evolving its own Bridge Course method (accelerated method of teaching/learning) for out-of-school/drop-outs/never been to school-children. The children are reintegrated according to age and appropriate levels in one year's time. CINI ASHA has designed a package of the Bridge Course curriculum and training module in collaboration with UNESCO for training approximately 400 community volunteers to date. CINI ASHA has also been a pioneer in designing modules and conducting training for NGO representatives in counselling street children in collaboration with National Institute of Social Defence. The innovative strategies have been replicated by NGOs and the Government at the national level.

Source: http://www.bestpractices.org/bpbriefs/social_services.html

Cooperation in Literacy Programme, Brazil: Illiteracy is a major social problem in Brazil with 1997 statistics showing an illiteracy rate of 55% in the 15-year and older age group in 38 Municipalities. The Cooperation in Literacy Programme was created in 1997 by the Solidarity Community Council, a national forum for the development of social programmes based on partnerships between Central Government, private organisations and civil society. The programme is managed by a non-governmental organisation, the Association for Support of Cooperation in

Literacy Programme. The programme's objective is to provide education to the illiterate at national level targeting regions with the highest illiteracy rates and adopting a model to meet the specific characteristics of each region.

The Programme's model is based on modules of semester literacy training that take place through a simple alliance between the Government, civil society and the academic community. Each semester runs for six months whereby one month is dedicated to building the capacity of literacy trainers, who are selected from within the targeted community. The trainers then embark on education programmes during the remaining five months. The programme targets the youths and adults, giving priority to the youth to ensure continuity where majority of the students are from rural districts. Financial resources are leveraged from the National Fund for the Development of Education and the Brazilian Ministry of Education. Members of the public, the Private Sector and individuals also contribute towards the programme.

By the end of 2001, 70 percent of the Municipalities involved had increased the number of student enrolment by 114 percent. The programme qualified over 100,000 literacy trainers. The programme aroused interest in the academic cycles resulting in the emergence of holistic solutions that address illiteracy in the country. Specific curricular subjects and specialisation courses have since been developed and include theoretical and practical guidelines. Before the inception of the programme, less than 10 higher learning institutions focused on education for youth and adults, but the number has since risen to 204. The programme began in 38 Municipalities is currently being implemented in 2,010 Municipalities, which correspond to 45 percent of the Municipalities of the country. The programme is also being replicated in East Timor, Sao Tome and Principe and Mozambique.

Source: http://www.bestpractices.org/bpbriefs/social_services.html

Social and Financial Empowerment of Poor Women in Chennai, India: Chennai, a coastal metropolis, has a population of 4.2 million people (sex ratio of 951 females to 1,000 males) and an area of 174 square kilometres. In 1977, floods and other natural disasters had terrible effects on the poorest of the Chennai, especially women. The Working Women Forum (WWF), an NGO was founded in 1978 to respond to the needs of heavily indebted women, whose labour was cheap and disposable, as they were not organised. Low cost and accessible credit was identified for effective relief from poverty, hunger, indebtedness and strengthening their productive role.

Initially, WWF acted as an intermediary between national banks and its members to facilitate their access to credit. Frustrated with the formal banking system, which did not address their needs, 2500 members of WWF, with the help of external donors, created the Working Women's Cooperative Society (WWCS) in 1981. The most important challenge was to identify and train a cadre of catalysts within each neighbourhood. It was also difficult to convince men that the programme should focus only on women. By 1982-83, however, group leaders managed to take control and the programme rapidly grew into a mass socio-economic movement. Since then, it has evolved into an emancipation movement for poor women with various partners joining the initiative, including the Government of India and UNFPA. Out of an initial seed capital of Rs. 50,000, WWF has grown into the largest credit cooperative network with a recovery rate of 97 percent and a cumulative disbursement of 396 million Rupees (Equivalent of US$ 8.8 million).

Many members have moved from trading and vending occupations to skilled and manufacturing business. 76 percent have been relieved from their indebtedness, 92 percent are now able to afford two meals a day, while 80 percent have improved their housing. By raising awareness on health issues, WWF has also created a voice and a demand for improved delivery of health services.

WWF/ICNW (Credit institution of WWF) is 80 percent operationally self-sufficient and 75 percent financially self-sufficient.
Source: http://www.bestpractices.org/bpbriefs/social_services.html

Women's Empowerment Programme, Nepal: Seventy percent of Nepali families are below poverty line. Male dominated cultural traditions discourage female education, restrict their legal rights and participation in decision-making, and permit women little control over their lives. Females are often malnourished or in poor health. Only 20 percent of them are literate. Women's Empowerment Programme (WEP) initiated in 1998 was founded on the principle that dependency is not empowering. It works to empower women through an innovative programme integrating literacy, micro-finance and micro-enterprise training and an understanding of legal rights and advocacy.

WEP, however, offers no seed money, matching grants or subsidised interest rates. Women must own the programme by creating their own group policies, paying fees, buying books, providing facilities and supplies, and finding literacy volunteers. WEP assumes that the poor will pay for the services they need. It requires all members to be literate, understand the banking process and know how to form and operate a business. As a result, women in-kind contributions are estimated at $260,000 so far. 240 NGOs work as partners for implementation. WEP also encourages financial independence and for every ten WEP group they work with, the NGO receives less than $5 for administration. As a result, in-kind contributions from supporting NGOs are estimated at $100,000 to date. The programme uses an approach based on Appreciative Planning and Action (APA) that was developed in Nepal and encourages women to build on their strengths and has been key to overcoming obstacles. This approach teaches an organisation to learn and implement a major programme in a transparent and accountable manner, to adopt low-cost methods to promote literacy and economic participation in order to reduce dependence on external funding. In summary, the programme instils a sense of self-reliance.

Overall, the programme shows that women can teach themselves the skills they need to improve their lives, to save money and start small businesses. Programmes based on this model can engage millions of women everywhere at costs they can afford. The no handout policy inspires motivation, pride and commitment in a programme integrating literacy, economic and legal components. Simplified books developed by partner NGOs enable newly literate women to teach each other basic skills. Within a few months, they start putting them to use in ways to ensure skill retention. The Programme reaches 123,000 women in nearly 7,000 economic groups in Southern Nepal.
Source: http://www.bestpractices.org/bpbriefs/social_services.html

Poverty reduction among women through vocational training and micro-financing programme, Uzbekistan: In Uzbekistan, with a population of 25 million and a GNI per capita of US $310 (World Bank, 2002), 27.5 percent of the population lives below the poverty line and 70 percent of the poor are in rural areas. Women are concentrated in the lower paying sectors and earn about 70 percent compared to males. The level of female unemployment is higher than that of the males (62 percent). The low level of self-employment is caused by lack of necessary skills and knowledge, limited access to credit for women and low participation in establishment of new enterprises.

To improve the situation, the Business Women Association (BWA) launched an integrated programme on poverty reduction among women, focusing on vocational training and micro finance in rural areas of Uzbekistan. The purpose of this initiative is to contribute to poverty reduction through empowerment of women and local economic development, assistance in the improvement of the living conditions of women, especially of those living in rural areas, and providing equal access to job and income generation opportunities.

The initiative has contributed positively to the economic situation of the country and has raised women's economic role and status by overcoming gender barriers. It has provided women with equal access to financial sources through micro credit lending programmes, small and medium entrepreneurship, job creation, institutionalisation, normalisation and registration of businesswomen. It has also given an opportunity for the capacity building of both BWA employees (thus, contributing to Business Women's Association of Uzbekistan BWA's institutional development) and entrepreneurs through training on various economic issues. 7,300 unemployed women attended vocational training courses and this initiative enabled them to acquire the necessary skills to become financially independent and/or to become businesswomen. This initiative was also able to advocate for a law that was approved by the parliament. With the aim of providing favourable legislative conditions for the activity of micro finance institutions, the BWA team lobbied for a decree on micro financing 'measures on development of micro financing activity', which was adopted by the Cabinet of Ministers on August, 20, 2002.

BWA constantly maintains business contacts with other women's organisations of Central Asia and promotes the exchange of knowledge and experience. The results of this initiative have proved to be sustainable, and BWA of Uzbekistan is actively engaged in replicating similar activities in Kazakh, Kyrgyz and Tajik.
Source: http://www.bestpractices.org/bpbriefs/women.html

4.10 Urban Planning

Urban Planning and Development Practices

Rehabilitation and Upgrading of the Manshiet Nasser Informal Settlement by General Organization for Physical Planning (GOPP) - Egpyt: The Rehabilitation and Upgrading of The Manshiet Nasser Informal Settlement, located in the heart of Cairo City, is a unique initiative to improve the living environment of more than 500,000 inhabitants. The project, which was initiated in 1997 by the Ministry of Housing, Utilities and Urban Communities of Egypt, is focused on relocating a percentage of inhabitants into a close by planned settlement equipped with all services and amenities, and development and renewal of the existing slum site. The process consists of nine phases to complete the biggest project of its kind in Egypt by building 70,000 housing units.
Source: http://www.bestpractices.org/bpbriefs/urban_development.html

The settlements are fully equipped with complete piped networks of water supply and sanitation, roads network, open space, vocational training and heath care centres, libraries, schools, phone service network, and environment friendly craft workshops. Residents are provided with a soft loan, 90 percent of which is required to be paid over 40 years, thereby giving the residents a sense of ownership. The project is based on participatory socio-economic survey and mechanisms of transparent dialogue with local inhabitants in both the planning and management processes. Major achievements of the project include affordable housing options for the poor; empowered civic engagement at early stages of decision making; institutionalised participatory urban management; maintained and enhanced livelihood systems for inhabitants; preserved social capital and ties of original dwellers; and sustained socio-economic development. The initiative has demonstrated how empowerment of local inhabitants to effectively participate in decision making at an early stage of planned interventions can reduce the scope of conflicts and enable mobilisation of resources for effective implementation. It has also shown that co-ordination among Government agencies, civil society entities and external support programme, though challenging, is necessary for effective and sustainable urban development.

Comprehensive Improvement of the Urban Environment, Zhuhai, China: Before its establishment as a city in 1979, Zhuhai was an

economically disadvantaged fishing village. The urban area was less than four sq. km. with little access to transportation. The daily water-supply capacity was only 5,000 cubic metres and there were no sewage and waste treatment systems. The telecommunication facilities were poor and the power supply was insufficient. Poor infrastructure conditions and an adverse living environment impeded the economic development. In 1980, the Zhuhai Municipal Government prepared a comprehensive plan for the improvement of the urban environment.

As a result, a new urban district covering 56.2 square kilometres was constructed. An additional 161 'all-inclusive' living quarters were built, thereby pushing the per capita living space up to 17.74 square metres, which is considered the best in the country. High-grade urban highways (around 400 km in total length), a large airport that conforms to top level international standards, and two 10,000 tonnage harbours were also constructed. Communication facilities were also improved including the water system, which complied with the national standard for drinking water. Sewage treatment plants and smoke and dust control systems were installed to ensure that the city complies with the national standards for air and water quality. A natural reserve covering 105.9 square kilometres has been set up and a three-dimensional protective system has been formed for urban afforestation with the urban greenbelt coverage rate standing at 39.9 percent and per capita green area reaching 114.97 square metres. The city Government has also passed laws and regulations related to urban environment management and set up an efficient administration system to handle environment related problems.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Park Central Taxi Rank, South Africa: Johannesburg is Southern Africa's largest and most vibrant city. Transportation problems arising from the taxi industry are considered the biggest problem facing South Africa's inner cities and this was no exception for Johannesburg's Jack Mincer area, where taxis invaded a 15-block area in the early 1990s causing urban decay of the surrounding area. The infiltration of taxis in the area caused the roads to become nearly impassable and made proper sanitation impossible and crime inescapable. In the absence of formalised management, the central point, Jack Mincer Park and parking garage, deteriorated to a point where it became unsafe and a health hazard for the general public.

In response to the urban decay in the area, the Greater Johannesburg Metropolitan Council (GJMC) put out a proposal call for the development of a formalised taxi rank in the area, which was approved in 1997. Funding for the project was provided by three tiers of Government in partnership with the Private Sector. The project cleared the surrounding streets of public transport activity that was an obstacle to traffic on inner city roads as well as to commercial development within the city by providing a parking area for 2,000 taxis. There is more efficient and safer transportation services for 160,000 commuters per day. The success of the project represents much more than just an improved transportation hub and the revitalisation of a community. It represents the coming together of public and private enterprise in a serious attempt to revitalise the Inner City. More importantly, it is the first project that gives formal recognition to an industry, which has been ignored and suppressed throughout apartheid and post-apartheid South Africa.

The use of milestones to facilitate progress and reaching a consensus is very useful in such developments. When the rank first opened, the usage fees were to be paid on a monthly basis by taxi drivers. This method proved to be inefficient and ineffective. In response to the inability to collect usage fees, a 'pay upon entrance' method was established. The success of the Jack Mincer Rank project has encouraged the Municipal authority to develop other ranks applying the lessons learnt in the decision making process.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

UCISV-VER Housing Programme for the Peripheral Areas of Xalapa, Veracruz Mexico: The Union of Tenants and Housing Applicants, Veracruz (UCISV-VER) is a community organisation that was established in Xalapa, Veracruz in 1984. The main problems afflicting the low income population in Xalapa was access to land for housing since they had settled on public land on the city's periphery, which was in a state of neglect and where urban service provision was nonexistent. These areas had grown considerably, largely due to rural out-migration with 46 percent of the city's total population of 400,000 inhabitants living on the city's periphery.

The project sought to improve housing, urban conditions and quality of life for the population living in 80 irregular settlements on the periphery of Xalapa, Veracruz. The project began with the elaboration of a partial plan for all the zones using participatory planning methods. This was finished in 1991 and was used as a basis for negotiation with the State and city authorities for land and services provision.

The project's achievements are the following:

- Training of a large section of the population in settlement issues and self-construction methods;
- The slogan 'protest with a proposal' came out of this process;
- Provision of ecological sanitary units in the peripheral area;
- Provision of urban services in the peripheral areas;
- Access to land (with a secure tenure) on a State Government reserve for construction of low-income housing;
- Construction of a prototype house, which is used in the self-construction training programme;
- Setting-up of a savings and loans scheme for the housing programme on the territorial reserve and for improving housing in the peripheral areas.

UCISV-VER's Integrated Social and Urban Improvement Plan had led to the realisation of several follow-up programmes including education, nutrition, the environment and urban management and planning.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Planning and Designing of the Civano Community Model, Arizona, USA: Civano is a model community demonstrating that the goals of sustainability and marketability are not irreconcilable. Specific performance targets were developed in 1990 using participatory processes to: (i) reduce energy consumption by 75 percent; (ii) reduce potable water consumption by 65 percent; reduce landfill-destined solid waste by 90 percent; (iii) reduce internal vehicle trip miles by 40 percent; (iv) create one community job for every two residences. By developing measurable and enforceable performance standards, Civano has shown how local resources can be saved and has enabled the City of Tucson to see its participation as a wise investment. Others are also investing in Civano: the nation's largest financial institution, Fannie Mae Corporation, has made its largest community development equity investment in Civano; the developer has committed 10 percent of its gross profits for inner city development. Based on the Civano experience, the City of Tucson has begun a city-wide sustainable development initiative using public participation to define the priorities. Other impacts include the adoption of new State legislation to promote the use of solar energy and national funding for photovoltaic product development.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Sustainable Economic Transformation and Decentralisation in Barcelona, Spain: Barcelona City, with more than 1.5 million inhabitants, is the centre of an extensive metropolitan region (RMB), which occupies a surface area of 3,236 km^2, inhabited by 4.3 million people (69 percent of the total population of Catalonia). Ciutat Vella is the city's principle historic, culture and leisure centre, since it contains the majority of its historic and artistic wealth. It represents 4.3 percent of the surface area of the city and 5.6

percent of its population. This district was experiencing major deficiencies in education and healthcare delivery, housing and town planning, loss of economic activity, marginalisation and unemployment. In response to this emerging trend, the city council, in partnership with citizens and the private sector, formulated an integrated plan to rehabilitate housing, improve public infrastructure, promote the economy and implement social welfare programmes.

The process of developing this integrated plan - mooted in the principle of decentralisation and Public-Private collaborations - required a public investment totalling US$ 806 million between 1988-1999. Facilities that are being targeted include construction and renovation of the museums, a public University, civic centres and a public hospital. More than 2000 public residential dwellings have been constructed and a further 22,400 residential dwellings refurbished. The houses have served to resettle residents affected during the actuation of the new plan to open up new spaces and/or roads. Urban redevelopment and social policies have improved the life expectancy of the district, its education levels, household income levels and economic activity, thereby reducing the economic and social gaps that existed within Ciutat Vella.
Source :
http://www.bestpractices.org/bpbriefs/urban_development.html

Local Agenda 21 Model Communities Programme in Jinja, (LA 21 MCP), Uganda: Jinja is the second largest urban centre in Uganda and serves as the principle urban centre and market for the Districts of Jinja, Iganga, Kamuli, Mukono and Pallisa, which together accommodate over 2.0 million people. The existing Municipality of Jinja encompasses an area of approximately 28 square km (2,800 hectares), and is strategically located at the point where the River Nile flows out of Lake Victoria. The town serves as a catchment area of about 3.0 million people. The increasing urbanisation and development resulted in corresponding demand and pressure on the environment that led to deterioration in environmental conditions. The LA 21 MCP was initiated in 1995 to improve services to residents, while protecting and improving the natural environment. This programme involved the active participation of community members and other stakeholders in problem identification, priority setting, analysis and activation processes. Partnership building was one of the main objectives of the programme and it began with the Municipal management identifying and inviting interested groups and institutions in the Town. ICLEI, Canada played a major role in the initiation and execution of the programme. Project appraisal contributed to the planning process by assessing progress and putting in place corrective measures. ICLEI provided technical guidance and feedback on activities, such as community consultation, issue identification and priority setting.
Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Poverty Eradication and Living Environment Improvement in Zhulin, China: Zhulin is a town with a population of 10,000 inhabitants located in the mountainous region of Henan province. Before 1995, Zhulin was an obscure village situated in the eastern mountain area of Gongyi City, Henan province. Poverty was pervasive affecting, to a larger extent, the women of the village. 60 percent of the women were illiterate and none had received a college education while only five percent of the women had jobs outside their families. Everyone in the village perceived the urgent need to diversify the local economy in order to create alternative sources of income and to improve their livelihoods. A series of meetings and discussions were held involving expert consultants to look at the possibilities of diversifying the economy.

In 1983, 400 households were mobilised to pool their savings of about US$ 1000 to open a quarry to exploit the abundant supply of rock and minerals. The quarry was registered as a collective enterprise and, consequently, the per capita income increased about tenfold with fixed capital assets reaching US$ 500,000 within four years. With these earnings, the villagers established a refractory plant in 1985 to produce fireproofing materials. Profits from

this plant were, in turn, invested in a cement factory that began operation in 1988. To keep in tune with the country's economic reforms, the villagers decided that it was necessary to attract outside capital to expand and help operate their businesses. In 1995, Zhulin became the province's key township with US$ 170 million of collective assets supported by eight companies and 58 industrial and commercial enterprises.

In 1995, a village-wide consultation on the sustainable urbanisation and development of Zhulin resulted in a strategy that saw an increase in the annual per capita output with daily per capita income increasing from US$ 600 in 1995 to US$ 1,200 by 2000. By 2000, Zhulin was able to pay the State US$ 10.5 million in taxes and other revenues, representing a radical departure from the situation prior to 1985, when the Municipal budget was continuously in deficit and the village depended on Government relief. This economic turnaround has enabled Zhulin to bring about major improvements in infrastructure including capital investments of US$ 26 million in all weather roads totalling 23 km; the provision of public toilets; a waste collection and disposal facility with 100 percent coverage; and street lighting - all of which were totally absent in 1985. New housing construction totalling 360,000 square metres has increased per capita living space to a very comfortable 36 square metres, with 90 percent of the population being re-housed in new neighbourhoods and housing estates. At the same time, the town has achieved 100 percent coverage in piped water supply, electricity, telephone and cable television. Household ownership of computers has reached 83 percent. Urban greening provides 19 m2 of green space per capita within the settlement itself as well as 200 m2 per capita reforestations in the surrounding hills. 92 percent of the women in Zhulin aged over 40 are actively engaged in social and economic production.

Source: http://www.bestpractices.org/bpbriefs/urban_development.html

Action Programme for Sustainable Guangzhou, China: Guangzhou (formerly known as Canton), situated on the Pearl River, is a city of seven million people, covering an area of 3,700 km^2. It is the capital of Guangdong Province, one of the first cities to have benefited from the economic liberalisation policies of the 1980s and is famous for its Trade Fair. As a staging point of the ancient Marine Silk Route, it is also a city with a history of 2,200 years. Since the mid-1980s, Guangzhou has witnessed double-digit economic growth and a booming population, placing considerable strain on its infrastructure, environment and cultural heritage. By the mid 1990s, traffic congestion became commonplace and the environment was rapidly deteriorating. Citizens, tourists and businesses were constantly complaining about the poor liveability of the city, which became a threat to the economic vitality of the city. All these problems arose from two decades of misplaced policies favouring economic development over quality of life.

In 1997, the Municipality initiated an Action Programme for improving the living environment so as to maintain and enhance Guangzhou's attractiveness both as a place to live and do business. In a major departure from past practice, the Municipal Government established partnerships with the provincial Government and the private and community sectors to finance the plan. Build, Operate and Transfer was also adopted for the construction and management of expressways and bridges. The Transportation Project required the resettlement of more than 14,000 households, businesses and institutions, including many small and informal enterprises and 67 vulnerable families, especially single female-headed households. One-time compensation grants were provided either in cash or credited to new housing and/or facilities in five new locations. Preferential conditions and assistance were offered to the affected vulnerable group. Over 300,000 volunteers, including 3,456 women's organisations and thousands of youth groups participated in traffic management and environmental improvement. Millions of citizens take part in

tree-planting in the month of March. Communities, enterprises and NGOs continue to raise funds to implement neighbourhood and district level projects. Key Municipal projects were approved on the basis of consultations and popular voting.

The first phase of the programme was successfully completed in 2001, and resulted in substantial improvements in traffic management, urban greening, sanitation, pollution control and the conservation of the natural and cultural heritage. The renovated downtown area took on a new look. Residents are enjoying a better quality of life and feel proud of their city, more so in light of the fact that they participated actively in both planning and implementation. The achievements of the Programme were recognised in December of 2001, when Guangzhou received the National Award for improving the Living Environment, and the Award of Nations in Bloom 2001, an international award for liveable communities. The innovative aspects of Guanzhou's Strategic Plan and the method of implementation, have served as an example for other cities in China.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Formulating UN-HABITAT's Integrated Guidelines and Framework for Eco-city, Korea: The initiative Creating a 'Green City Hanam' was conducted with a view to transform Hanam from a rural and unplanned city into a sustainable and environmentally sound self-sufficient city with a well-structured urban development and growth management. Since 1971, 98.4 percent of Hanam's total area has been designated as green belt zone and local residents have been complaining about the legal restrictions in most areas. Therefore, there was a need to transform Hanam into a sustainable and environmentally sound city. To this end, in addition to a guideline for sustainable city development, four strategies were formulated based on: green belt deregulation policy; landscape ecology; development axis of 2016 Hanam City Master Plan; and an expanded town concept. Hanam generated a comprehensive and long-term framework to achieve this goal. The city sought the assistance of UN-HABITAT and UNEP to define the basic direction of an Eco-city and to introduce environmental technologies and international support programmes. Four main considerations were used: (1) energy saving, (2) water circulation, (3) land use and transportation, and (4) biodiversity and urban space structure.

As a result of a partnership between UN-HABITAT/UNEP, UNDP, the Environment Promotion Foundation, SNU, Korean and foreign experts of various fields, citizens and NGOs, Hanam was able to realise most of its goals. Among them was the development of a local Agenda 21 to realise an Eco-city plan and creation of a database based on an ecological survey conducted by experts. In leading the Eco-city plan to actual implementation, another unique feature has been the use of pilot projects. A trust was established for pilot projects to facilitate Eco-city development focusing on the development of Agenda 21 and investment. Having achieved more environmentally sound and globally sustainable development, Hanam then embarked upon the Hanam Sustainable City Programme (SCP). Forging of partnerships proved that planning can only be effective through a local community base. The 'Hanam's Biodiversity Strategy' was presented at the 'Urban Environment Forum' in Cape Town, September, 2000, and the city of Hanam won the '2001 Asia Green City Award' in Singapore, in September, 2001. This is an on-going project and its impact on other cities in Korea is noticeable and the Hanam initiative is being replicated as an Eco-city model all over Northeast Asia.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Sustainable Urban District Freiburg-Vauban, Germany: The city of Freiburg bought the Urban District of Freiburg-Vauban, which had been used as an army base for over 50 years. The area occupies a 42-hectare site and is being developed for a population of 5,000 inhabitants by the year 2006.

'Forum Vauban', an NGO created in 1994, has become the official body for citizen participation in Municipal affairs. The City of Freiburg formed a special committee to spearhead activities to transform the Freiburg-Vauban for use by the civilian population. Regular meetings took place between the Forum Vauban and members of the City Administration with special roundtable and workshop sessions where necessary. The process is guided by stipulations in the master plan including specifications on the height of the buildings, standards for low-energy use and consumption, the general structure of the development site and other regulations concerning rainwater infiltration and the greening of facades and roofs. To address social issues, city welfare institutions were established to provide services and support to specific target groups - children, youth, families and to enhance conflict resolution while supporting grassroots initiatives.

The current neighbourhood houses 1,200 citizens, 10 percent of whom are children below 10 years of age. All houses have been built to utilise improved low energy standards. Carbon dioxide emissions have been reduced by 60 percent through the use of insulation and efficient heat supply systems that utilise solar power and a co-generation plant. Traffic congestion has reduced with 35 percent of households agreeing to live without motorised units and the introduction of a car sharing system. Play grounds and public spaces have been reserved for green development. Building owners have come together to form an organisation that develops schemes that enable the low-income earners to become homeowners. An extremely high level of citizen participation characterises the housing project, not only in planning, but also in construction. The ecological housing scheme has made solid contributions to the European sustainable development debate on energy conservation, reduction in car use and the creation of a green living environment for children and community activities.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Sustainable Urban Development in the City of Malmo, Sweden: The city of Malmo has a population of 259,579 with a large majority being foreign citizens. The Western Harbour of Malmo was a landfill with polluted soil and a former industrial estate belonging to the Kockums shipyard. The Augustenborg district, built as a post-war model in the 1950s, could not cater to the needs of the growing population and was faced with myriad social and economic problems. Building new and revitalising old residential areas were identified as priority needs for the region.

The Municipality of Malmo, taking into account the Local Agenda 21 action plan, the Comprehensive Plan for Malmo 2000, the Environmental Programme and the Gender equality plan adopted by the City Council in 2001, embarked upon two comprehensive housing projects in the Western Harbour of Malmo. A local housing company, in partnership with the City of Malmo and the local community, initiated the Ekostaden Augustenborg project. 1,800 dwelling units were rehabilitated with 95 of them being reconstructed for people with special needs. A pilot recycling project was established and an electric car pool was set up as a means of affordable shared transport. Green space is better maintained and local treatment of surface water run-offs has decreased the risk of flooded basements during heavy rain.

The Bo01 - City of Tomorrow was initiated to transform the Western Harbour from a polluted wasteland to an ecologically leading edge example of sustainable urban development. The process started with large efforts made at cleaning the polluted soil. Infrastructure for traffic, energy, waste and water were established and 600 new dwellings constructed to accommodate the different needs of the elderly, students and families. The district is supplied with 100 percent locally produced renewable energy. The 'Quality Programme for Bo01' guides the programme by outlining minimum level of quality required. As a result of these projects, the City of Malmo has noted a change in people's attitudes and behaviour with increased recycling of

household waste and increased popularity of the bicycle as an alternative mode of transport. A wide range of innovative 'green' products and services has resulted from the projects, e.g., green roofs, low energy villas and renewable energy solutions.
Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Livable Region Strategic Plan (LRSP) for the Greater Vancouver Regional District, Canada: The Greater Vancouver Regional District had been experiencing population growth from 750,000 in 1980 to 2,030,000 in 2002, thereby increasing pressure on the green space, traffic congestion and resulting in declining air quality. There was a lack of vision and no co-ordination of development actions within the region.

The 21 member Municipalities of the Greater Vancouver region brought various stakeholders together in a series of workshops to develop the Livable Region Strategic Plan (LRSP). At these fora, the protection of a regional network of green space held strong interest leading to the creation of a Green Zone as an effective urban containment area while protecting the region's ecology, health and agriculture. The LRSP was developed as Greater Vancouver's official regional growth strategy and is built around four main goals:

- Protect the green zone;
- Build complete communities;
- Achieve a compact metropolitan area; and
- Increase transportation choice.

The LRSP provides the framework for making regional land use and transportation decisions in partnership with the Greater Vancouver Regional District's 21 member Municipalities, the provincial Government and other agencies guided by a shared vision. Urban centres were identified and have been successful in containing development efforts within a concentrated urban area, while establishing diverse and more complete communities. The plan led to the establishment of a regionally controlled and operated transit authority (Greater Vancouver Regional Transit Authority) from the previous provincial entities. These initiatives have enhanced the region's social, economic and environmental health. Implementation of the plan is integrated into the budgets of the member Municipalities through their official community plans.

As a result of this initiative, the protected green zone has increased by approximately 60,000 hectares since 1991. Air quality improvements have been significant as a result of reductions in emissions from industry and vehicles. A key contributing factor to the success has been the formulation of a shared vision that guides the development. The LRSP proves that this can lead to large scale impacts on the structure and characteristics of a region. It also shows that partnership between spheres of Government and communities is achieving tangible results. What makes the Greater Vancouver Regional District stand out as compared to comparable practices is the scale of its coordinated effort. Vancouver demonstrates that sustainable development is a planning concept that benefits development and the environment.
Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Ciechanów - Sustainable Town, Poland: In 1975, the small town of Ciechanów (population - 24,000) became the capital of Ciechanowskie province in Poland. During the next 14 years, Ciechanów population doubled as a result of rapid industrialisation and immigration of people from neighbouring villages. Living conditions in the town became very arduous, because of an economic crisis in Poland, there were no investments in infrastructure, services or social facilities.

The main goal of the project was to improve living conditions through comprehensive sustainable development of the town. Some of the detailed objectives were to improve drinking water quality, air quality, health provision, and promote sustainable land use management. To achieve these goals, the town built a new wastewater treatment plant (with a

15,000 m3 capacity/day) achieving a 95 percent reduction in pollution levels. There was a reduction by a third in phosphates' concentration and while phosphorus levels went down by 50 percent in the river. A new 12 hectare landfill site was built with a draining pipe and waste is currently separated on site.

The town demolished 48 local coal-fired boiler plants and built a central heating plant and installed energy saving distribution pipes. The company operating the heating plant has signed the Cleaner Production Declaration. All five new communal buildings are built using energy-saving technologies and old buildings are repaired in order to decrease heat losses (isolation of walls, roofs, new windows and doors) and equipped with facilities for the physically challenged. Social amenities have been set up including a new sports complex with a multi-purpose hall and indoor swimming-pool; a new primary school to cater to 900 children with full-sized sports hall, soccer field, other sports equipments and sports-specialised standards at the newly-built housing estate. Public participation, especially women, was registered in the decision making process of the 'Ciechanów - Town Of Health' programme. Donor support has enabled affordable healthcare provision to all the city's residents.

Source: http://www.bestpractices.org/bpbriefs/urban_development.html

Fresh Water Management and Environmental Improvement in Taiyuan City: In the late 1970s, the Taiyuan City section of the course of the River Fen became heavily silted and polluted owing to rapid economic and industrial development becoming one of the most heavily polluted cities in the world in terms of air and water quality. The pollution of the urban stretch of the River Fen was seriously affecting the livelihoods and health of the inhabitants on both banks of the river and hampering the economic development of Taiyuan City.

In 1997, with the adoption of a national urban development and environmental protection policy, the Taiyuan Municipal Government decided to carry out feasibility studies focusing on pollution management, water storage and urban greening. In line with the principles of Agenda 21 and the Habitat Agenda, the Municipal Government decided to involve the participation of citizens, experts and other stakeholders in the formulation of a plan of action. The overall plan for managing and remediating the River Fen was led by the Beijing Survey and Design Institute, under the aegis of the Ministry of Water Resources, while the contractors for the implementation of the projects were selected through open tender. In September 1999, the Municipal Government invited multi-disciplinary experts from National Governments agencies, leading universities and research institutions, local authorities, enterprises and Non-Governmental Organisations to hold consultations and discussions on the plans and the projects. In December 1999, the plan for the remediation and management of the River Fen was adopted in a referendum involving over 40,000 citizens. In April 2000, the Municipal Government called upon hundreds of people from all walks of life to participate in a public hearing on the implementation of the project. By September of the same year, a large multi-functional and ecological park was completed together with the environmental remediation of the urban stretch of the Fen River including de-silting, pollution and flood control.

Owing to the extensive publicity and mobilisation by the Municipal Government and the media, 16 large enterprises and some 700,000 members of the army and civilians participated in the clearing of 1.3 million square metres of the river course; the displacement of 4.3 million cubic metres of earth; the removal of 78,000 cubic metres of silt from the river course; and levelling of 226,000 square metres of channel beds. This voluntary contribution resulted in savings of US$3.44 million for the project between October 1997 and August 2000.

The project created jobs for over 30,000 people and turned the 6-kilometre long and 500-metre wide natural river course of the

urban section of the River Fen into multiple river channels. The project created 1.3 million square metres of green space and a water surface covering 1.78 million square metres. Both embankments of the river have been turned into six garden zones, four squares, and 14 scenic spots with varying characteristics with a capacity for 130,000 tourists and sightseers. Wastewater is treated at a wastewater treatment plant located downstream. The purified water is transported through a pipeline to the water storage ponds to be used as the source of water supply for the scenic spots, for irrigating gardens and to restore the natural flow of the river. The flood discharge capacity of the river course was increased to 3450 cubic metres/minute, adequate to deal with 100-year flood risk. Changes have been noted in the production cycle of the city's industries, with awareness created on environmental issues and civic engagement and participation being recognised as the basis for long term sustainable development for the city.
Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Renovation of the Old City of Hebron, Palestine: Hebron, one of the oldest and most sacred cities in the world, is located in the south of Palestine and has about 140,000 inhabitants. In addition to agriculture, the local economy relies on handicrafts, small and medium-scale industries and construction. Hebron is one of the best-preserved examples of medieval cities in the world, but was progressively abandoned and had been in a bad state after the Israeli occupation of the Old City in 1967. Various campaigns and the consequent tighter restrictions on the movement of the residents together with increasing economic problems forced most people out, leaving those, who were socially marginalised and could not afford to improve the existing housing facilities, urban infrastructure, prevent decay of cultural heritage and environmental degradation.

Since its inception, the Hebron Rehabilitation Committee (HRC) aimed at preserving the cultural heritage as a key element for keeping the collective identity of the people of Hebron; counteracting the Israeli political pressure by repopulating and revitalising the highly threatened, neglected and poverty-stricken areas in the old city; and encouraging community participation through the provision of adequate and affordable housing compatible with a cultural heritage conservation policy taking into consideration the social, economic and cultural aspects of the residents. It has promoted legal initiatives in an attempt to halt further Israeli settlement constructions and demolition of Arab-owned houses. The rehabilitation programme promotes the use of labour-intensive methods as a means to create sustainable employment opportunities; provide specialised training on traditional methods of conservation; and increase the level of income of the community. The HRC is working closely with several Governmental bodies of the Palestinian National Authority (PNA) and many other Governmental and Non-Governmental Organisations. It has received political and financial support by many Arab and international donors and organisations.

The HRC has succeeded in rehabilitating historical buildings and urban infrastructure in accordance with international renovation standards while converting these buildings into affordable residential apartments. More than 526 apartments have been renovated and eventually inhabited. Some of the commercial markets, streets and underground infrastructure have been renovated. The Committee has installed iron doors and windows for approximately 279 houses. Health care facilities have been provided for the community. The Committee was able to change people's perceptions about Hebron from a bad, unsecured environment into a pleasant place to live in. Several new residents have moved into the old city since 1997.
Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

The Pride of Place Programme, Australia: Australia has a Federal system of Government. State Government is the middle level of three tiers of Government: Federal, State and Local. Victoria is the smallest and most densely

populated State in Australia with a population of five million. Melbourne is the capital of Victoria and is dominated by the Yarra river.

The Pride of Place Programme was initiated to spread the benefits of good strategic planning and urban design to the whole of Victoria in response to the visible decline of many suburban, regional and rural centres, and inspired by the successful urban revitalisation of central Melbourne.

The Programme is a partnership between State and Local Government. Local Government Agencies apply for co-funding for projects given priority by their communities. The State gives priority to projects in areas of perceived need of assistance, such as towns affected by natural disasters. The Department of Sustainability and Environment (the Department) manages the programme.

Grants encourage Councils, working with their communities and urban design professionals, to develop visions and strategies for lively, economically sustainable, attractive and safe local centres. Councils are assisted to manage change, such as development pressures or industry decline, by reinforcing the attractiveness, unique character and cultural heritage of local centres.

After funding for a new Programme is confirmed, an information brochure, which clarifies objectives and selection criteria, is produced and distributed to eligible applicants, accompanied by a letter from the Minister for Planning inviting applications. Applications include the amount of their proposed contributions and amount of funds requested. The value of grants requested ranges from $5,000 to $300,000.

Presentations by Regional Offices and subsequent reviews by the Panel take three to four days. The Panel considers the relative merit of all applications, based on published selection criteria, and submits recommendations to the Minister for Planning for approval.

Applicants are notified of the result of their application. Successful applicants receive a Letter of Offer and Terms and Conditions of the grant including a Schedule and Performance Milestones agreement. The applicant, together with the Regional Office, must complete these. The contractual stage is important to reduce the risk to the State of Councils defaulting on agreements after receiving funding.

The projects have generated high levels of community support and pride through consultative and inclusive design processes. The Programme fosters goodwill between the State Government, Councils and local communities. The projects also promote sustainable development through the development of long-term strategies to manage global and local changes. The development of attractive towns and cities helps to retain and increase resident populations and attract more visitors.

Many projects in rural and regional locations have provided or strengthened existing recreation and tourist attractions, protecting the delicate balance between natural flora and fauna and the intrusion of people through limiting access to protected areas, creating elevated boardwalks, and enhancing environmental awareness with signages at key points.

Source: http://www.bestpractices.org/bpbriefs/urban_development.html

The Alba-Ter Consortium - a commitment to territorial cohesion, economic development and sustainability basin of the River Ter from the local initiative, Spain: The population of Spain stands at 42.7 million (official figure, 2003), with a Gross National Income (GNI) per capita of US $14,580 (World Bank, 2002). The River Ter basin (located north-east of Catalonia) used to be the economic motor of the region. Today, the problems that affect this territory are multitudinous and assorted, such as environmental degradation, water outflow, loss of biodiversity, destruction of the river basin and its cultural heritage, lack of territorial unity

and a lack of a common policy framework linked to the river. What stands out about this river is the total lack of territorial cohesion.

It is against this background that, at the end of the 90s, a local initiative led by seven riverside town councils, promoted the creation of an organisation to advocate for territorial cohesion, economical development and the sustainability of the river basin. Alba-Ter/Ave Project received funding from the TERRA Programme of the European Union in 1997 and work began to set up an organisation capable of managing this ambitious project as well as to mobilise economic resources in order to develop and implement it.

The Alba-Ter/Ave Project elaborated an Integral Development Plan for the River Ter. Once the project was finished in May of 2001, the Alba-Ter Consortium began working as the organisation in charge of executing and implementing the strategies that arose from such an ambitious project. At present, this organisation represents 90.6 percent of the riverside population and 55.3 percent of the total river basin population.

Among the activities achieved so far are the formulation and implementation of integral and global spatial development strategies oriented toward territorial cohesion of the river basin; valorising the natural and cultural heritage of the territory both as an asset to be preserved and as part of the territory's identity; promoting the equality of opportunities for all the member Municipalities, in spite of their dimensions and the difference in economical, technical and human resources; the introduction of Information and Communications Technologies to promote access by all the territorial bodies, associations and the citizens to technical information related to the consortium; and establishment of a forum for debate on the river space, including web page, interactive cartographic service based on the GIS.

Some of the public institutions, which provide financial support to the consortium, participate directly in the entity's management, thereby assuring the efficient and rational use of funds. Private funds also exist for specific projects and finally, the consortium has also its own income. In the future, the possibility has been presented of obtaining income through the Ministry of information and from the management of projects.

Source:
http://www.bestpractices.org/bpbriefs/urban_development.html

Integrated Management of Water Resources in The Paraiba Do Sul River Basin, Brazil: The Southeast Coastal Hydrographic Region of Brazil has an area of 231,216 km^2, accounting for three percent of the country's total area mass and has a mean river discharge rate of 4,024 m^3/s (three percent of the country's total). Its main rivers are the Paraíba do Sul and Doce rivers that run for 1,150 and 853 km, respectively. The Paraíba do Sul basin alone produces an impressive 10 percent of national GDP. This hydrographic region also presents significant economic differences, with the GDP per capita ranging from Rs. 5,239 in Minas Gerais to Rs. 9,210 in São Paulo. The national GDP per capita is Rs.5,740.

The Paraíba do Sul river crosses three of the most important and developed States of Brazil: Minas Gerais, São Paulo and Rio de Janeiro. It is the main water supply for more than 11 million people in Rio de Janeiro City, and it is also used extensively as a waste disposal system by industrial facilities in all the three States. The river basin has a total population of 7,600,000 (IBGE/2000 Census). The integrated water management initiative is a model of sustainable management for this important river basin to guarantee water for future use.

The establishment of a committee (CEIVAP) comprising 60 members from Central Government, nine State Governments, local authorities, research institutes, industries and water users is a complex and effective model of partnership. The objectives were to implement a pioneering and fully operational management system and establish a set of instruments in compliance with the Brazilian

National Water Resources Policy and the respective Federal Act 9433/97. CEIVAP, thus, obtained resources for structural interventions in environmental remediation and improvement of water availability in a river basin. The committees also introduced billing for water use covering large portions of three key States: Rio de Janeiro, São Paulo, and Minas Gerais, with 180 Municipalities, all characterised by extreme economic, social, and political heterogeneity. The discussions and approval of water billing rates took into account users' economic interests and involved various sectors and participation at various levels in the Committee.

The initiative has been successful in implementing structural interventions in the water supply, sewage treatment, waste collection, drainage, and slope stabilisation in order to arrest and reverse environmental degradation and ensure the availability of water resources. This type of management system involves participation by society as a whole in the preservation and use of rivers (some 127,000 litres of water per second are drawn from this river basin every day, which are used for household, industrial, and irrigation purposes), including a sustainable water supply for 14.4 million inhabitants, 80 percent of whom are in Greater Metropolitan Rio de Janeiro. A Programme for Participatory Mobilisation was established to ensure decentralised and participatory management. The sensitisation campaign was realised through the Waterway Environmental Education Programme.

Source: http://www.bestpractices.org/bpbriefs/urban_development.html

Downtown Urban Renewal Intervention - Third Millennium Project, Bogota, Colombia: Third Millennium project is located in downtown Bogota, which has a population of 230,000 of whom 2,500 were homeless. This sector presented the highest indicators of crimes and murders, the lowest life expectancy, and was identified as a haven for drug pushers and addicts. Initiated in 1998 by City Mayor Enrique Peñalosa Londoño, the project, promoted by the Public Sector, is aimed at complete urban and social recovery of the most deteriorated area of the city located at Santa Ines neighbourhood. The objectives of the project are to rehabilitate downtown Bogota and promote social inclusion of citizens, offering a better quality of life to its inhabitants. The strategies employed included rehabilitation of drug addicts, housing projects, health, education and social welfare programmes that were made accessible to all. The project was divided into phases that outlined different priorities depending on the needs of the specific community.

This project is the first ever-integrated urban renewal intervention in Bogota, undertaken by the Government. After consultations with the community in Santa Ines neighbourhood, the Urban Development Institute, working closely with the Municipal Authorities, acquired land from homeowners and businesses operating in the area that were temporarily relocated to other neighbourhoods. The structures standing on the earmarked land were demolished, a section of which was dedicated to the creation of a Metropolitan Park. The San Victorino sector was earmarked for redevelopment of a commercial and economic sector, the 'shopping mall with open sky'. The Urban Renewal Programme is working with the community (residents, formal and informal merchants, private organisations) drafting agreements and establishing laws to guarantee the sustainability of the public space that is being recovered with joint investments and encouraging new real-estate developments. The San Bernardo neighbourhood has as its main purpose the rehabilitation of residential areas. The Urban Renewal Programme promotes housing programmes with private investors.

As a result of the initiative, 585 properties have been acquired, 65 percent demolished and 1.5 hectare has been opened as a Park to the public. 4.4 hectare is currently under construction and was opened in April 2002. The relocated businesses have appropriate infrastructure in an improved environment. The monetary compensations that were given to residents have become a policy for the

Urban Development Institute when relocating low income residents during the process of construction. Security improved markedly with 1,948 drug addicts being treated and rehabilitated. Education was made available to 1,025 high-risk and socially excluded individuals, such as drug addicts, children, the elderly, and female headed households among others. 260 people have made a transition from the informal sector to the formal, while 160 families received title deeds to their rehabilitated houses. Over 5,000 jobs were created during the various phases of construction and health assistance was provided to over 4,000 persons.
Source: http://www.bestpractices.org/bpbriefs/social_services.html

Community-based Women-oriented initiative to fight poverty, Kerala, India: Kerala represents only 1.18 percent of the total area of India and has a population of 31 million. A quarter of the population resides in urban centres with a 91 percent overall literacy rate. Initially, manifestations of poverty were visible in varying intensity in all the 58 Urban Local Bodies of Kerala, despite implementation of several poverty reduction programmes by the Government, owing to the 'top-down' planning approach adopted. The Community Development Societies' (CDS) structure flourishing in the State of Kerala, India, is an innovative community-based, women-oriented initiative to fight poverty. All urban-based poverty reduction programmes are now implemented through a tripartite Community Based Organisations' (CBOs) structure. This unique and innovative system that evolved as a result of decentralised planning has already gained international recognition as a highly effective participatory system to do away with the manifestations of urban poverty.
Source: http://www.bestpractices.org/bpbriefs/women.html

The urban CDS system of Kerala offers poor urban women an open forum to express their anguish, anxieties, aspirations, developmental needs and priorities. After identifying and prioritising these developmental needs, the poor women formulate and implement poverty reduction action plans. Identification and analysis of poverty instances using 'non-economic risk indices', economic and social empowerment of poor women and their families through promotion of micro-enterprises, education and cultural vitality get priority in the CDS structure, derived from the Kudumbashree Mission (the State Poverty Eradication Mission).

Within a short span of three years, Kudumbashree Mission has brought about a sea change in the lives of the urban poor of Kerala by converging resources, ideas and programmes of various Departments through the CDS system. 169,000 poor urban women of the State have been organised into 7,848 grassroots level Self Help Groups. Among other laudable achievements include mobilisation of savings and informal banking, which has resulted in the disbursement of US$ 1.18 million among members with a 100 percent repayment rate. The CDS structure has hitherto given birth to 12,991 vibrant micro enterprises, with 20,000 women owners. The urban CDSs of Kerala run remedial education centres to help out poor students in preparation for public examinations. Remedial Education Centres of the CDS structure act as 'double-edged swords' to fight poverty, as they not only enhance the educational standard of the students belonging to poor families, but also give gainful employment to educated poor women. Community Based Organisations have mobilised their members and partners to construct 21,987 houses and 20,049 toilets for the urban poor.
Source: http://www.bestpractices.org/bpbriefs/women.html

4.11 Municipal Solid Waste

Water source, e.g., spring can be protected from Municipal Solid Waste by constructing a concrete base around it at tourist transit points/*dhabas* in rural areas. This will not only protect water from solid waste scattered around it, but also provide quick collection of water for usage.
Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand.

Eco-design of Tourism Facility: This new approach should be based on the concept of *eco-design*, which may be defined as "any form of design that minimises negative environmental impacts by integrating itself into the surrounding ecosystem."

- Apply bio-climatic design criteria, which means understanding the physical setting of the facility, the local climate, including prevailing winds, solar radiation, appropriate local materials, bio-degradation, surrounding vegetation etc.
- As regards waste management, always apply the quadruple principle: recycle, reuse, refuse and reduce.
- Set up a waste separation programme that ensures the separation of paper, aluminium, organic waste from kitchen and garden, glass, batteries, and other hazardous waste substances. Whenever possible, convert bio-degradable waste to compost, utilise the biomass or submit the waste to digestive anaerobic systems.
- Try to use bio-degradation practices as much as possible. In the process of bio-degradation, micro-organisms break down the products of other living things and incorporate them back into the ecosystem. Bio-degradable or bio-convertible material includes anything that is organic.
- Rechargeable batteries offer more cost-efficient alternatives for saving energy and cutting down on expenses. A rechargeable battery replaces approximately 100 disposable batteries.

Source: www.uneptie.org/tourism/bestprac.html, Integrating Biodiversity into the Tourism Sector / Best Practice Guideline; National Environment Commission, Royal Government of Bhutan August 2004/Environmental Code of Practice/Tourism Activities; Guide for Sustainable Tourism Best Practices.

Development and implementation of code of environmental conduct for tourists/trekkers under eco-tourism: In the absence of a code of conduct for eco-tourism and trekkers/campsites, a simple code of conduct can be developed and implemented in the State. A code of conduct leaflet was developed by the local community at Yuksam, Sikkim and implemented to promote eco-tourism. Some of the basic do's and don'ts of eco-tourism related to waste management that can be promoted are listed below:

Do's

- Carry back all Non Bio Degradable litter, such as empty bottles, tins, plastic bags etc. These must not be litter the environment or be buried. They must be disposed off in municipal dustbins only.
- Observe the sanctity of holy sites, temples and local cultures.
- In case temporary toilets are set-up near campsites, after defecation, cover with mud or sand.
- Leave all Camps and Trails clean.
- Separate and properly dispose off litter. Bury bio-degradables, and carry back all other non-biodegradable materials for deposit at designated trash sites or for recycling. Use toilet tents on all treks. Set up and use toilet tents at least 100 metres away from water bodies to avoid water pollution.
- Use established campsites and kitchen sites, avoid trenching around tents.
- Re-package food into reusable plastic containers to reduce waste.
- All visitors should only use designated campsites approved by the Department of Tourism.
- If toilets are not provided, holes must be dug in designated areas and not randomly. This is required for sanitation reasons as well as to maintain the campsite.
- If kitchen huts are not provided at the campsite, then kitchen tents should be pitched in designated areas, away from the main tenting area. This is required in case of fire and also for hygiene.
- All bio-degradable waste should be disposed off in a general waste pit. It should be disposed off below snowline. Non bio-degradable waste should be carried back and disposed off only at or below the road head. Photo documentation should be submitted in case of expedition.

- Never litter. Always pack out trash and dispose off at authorised places.
- Conserve Natural and Cultural Heritage.

Don'ts

- Do not use pollutants, such as detergent, in streams or springs while washing and bathing.
- Do not use wood as fuel to cook food at the campsite.
- Do not leave cigarette butts or make open fires in the forests.
- Do not consume aerated drinks, alcohol, drugs or any other intoxicant and throw away bottles in the wild.
- Polythene and plastics are non bio-degradable and unhealthy for the environment and must not be used and littered.

Source: Community Initiatives in Ecotourism: A Case Study from Sikkim, India, Environmental Code of Practice, Tourism Activities; National Environment Commission, Royal Government of Bhutan August 2004; Guidelines for Expenditure, Indian Mountaineering Foundation.

Eco-tourism should be strictly regulated: No new area should be opened without thorough scrutiny and evaluation of the impact on the environment by the experts. For example, the Government of Uttarakhand has restricted the number of tourists visiting Gangotri to 150 per day.

Define group size: Small groups (6-10 persons) make for better communication, higher visitor experience quality and lower impact. In case of increased demand, prepare a visit plan according to your facility's capacity. In these cases, the use of guides is highly recommended.

Source: Guide for Sustainable Tourism Best Practices; Community Initiatives in Ecotourism: A Case Study from Sikkim, India, Environmental Code of Practice, Tourism Activities.

Capacity building for service providers: Capacity building for service providers, such as *dhaba* staff, taxi/coach drivers, training of hotel staff, receptionists, training for helpers (Bed and Breakfast scheme providers).

Source: Documentation of Best Practices Adopted by the State Governments for the Development of Tourism.

Provision of compost pit for disposal of bio-degradable solid waste, which otherwise is disposed off in open outside the households in rural areas. This practice has been found to prevent contamination from flies, a major contributor to the spread of diarrhoea. Provision of trash bins at selected places in villages has been found to divert rubbish at one place, thereby contributing in reduction of disease.

Source: Improved Community Health through Natural Resource Management. RUCHI, Himachal Pradesh, India, A report by Oxfam New Zealand.

Participatory approach has been adopted as part of Slum Improvement Project (SIP) to provide water supply and sanitation facilities in urban areas. This has been achieved based on the contribution of households to implementation costs of the project and creation of infrastructure at community household level. Further, the SIP has significantly raised levels of awareness, particularly in health and sanitation among slum dwellers, resulting in significant reductions in the incidence of numerous water and sanitation related diseases. These best practices have been pilot tested in slum areas of Dhaka in Bangladesh and Ahmadabad, Gujarat in India and replicated in other urban centres.

Source: www.unhabitat.org/best practices, Best practice for demonstrating Slum Improvement Project in Dhaka Metropolitan City, Bangladesh, Case Study Ahmadabad Slum Networking Programme-India.

Buffering wetlands/water bodies/ reservoirs from human pressure and rejuvenation of natural process for wetland / water body / reservoir restoration: Conservation and restoration of wetlands/water bodies/reservoirs involve not only buffering them from direct human pressures, but also maintaining all other important natural processes, which are directly linked to supporting them in maintaining the fragile ecosystem. Measures like controlling soil erosion, reducing pressure on wetland/water body/reservoir resources and, most importantly, changing the attitude of

people in using wetlands are important for conservation and restoration. Long term measures include creating buffer zones for wetland/water body/reservoir protection, limiting anthropogenic activities around them and helping in reviving their natural functioning. The restoration programmes with an eco-system approach helps in correcting Point and Non-point sources of pollution. This, along with regulations and planning for wildlife habitat and fishes, helps in arresting the declining water quality and the reduction of loss of wetlands/water bodies/reservoirs.

An integrated approach to manage the wetlands is required where a conservation of following measures can be used to restore wetlands/water bodies/reservoirs.

- Pollution abatement practices to reduce non-point source of pollution through source reduction and waste minimisation.
- Afforestation with native species in areas around the wetland/water body/reservoir to control the entry of silt from runoff.
- The shorelines of the lakes should be lined with bricks or stones in an attempt to control shoreline erosion.
- Creation of artificial wetlands/water bodies/reservoirs for the purposes of storm water management and pollutant removal from surface water flows.
- Infiltration trenches for reducing the storm water sediment loads to downstream areas by temporarily storing the runoff.
- Rotation of crops rather than monocultures to reduce the need for Nitrogen and to assist with pest control and help in aeration of soil.
- Promoting public education programmes regarding proper use and disposal of agricultural hazardous waste materials and regular monitoring of wetlands/water bodies/reservoirs.
- Promoting recreational facilities and creating public consciousness is essential part in prompting people in general to take initiative in protecting wetlands.
- Rainwater harvesting is one of the key steps to be adopted in urban communities where most of the area has been metalled either by roads or concrete buildings to improve groundwater recharge, and thereby reduce the pressure on wetlands/water bodies/reservoirs to meet the urban water resources demands.
- Along with rain water harvesting, storm water management helps in reducing the pressure on wetlands/water bodies/reservoirs. In urban areas, rainwater is diverted to sewerage drain, which is expensive to treat and use for any utilities. Investment can be made to have a separate drain for storm water to which the rainwater harvested in each and every individual unit is connected. It will be then cost effective to treat and use the stored rain water for non-potable water utilities in industries, for gardening and for other non-potable purposes.

Source: Nanda Kumar, Wetland Conservation in India; need for effective legal framework. http://www.nlsenlw.org/environmental-protection/articles/wetland-conservation-in-india-need-effective legal-framework/sendto=form

Good practice in Solid Waste Management in buffer zone for conservation of lakes/wetlands: Door to door collection of solid waste from households in buffer zone and direct disposal using composting can assist in conservation of lakes and wetlands. For example, the conservation of Naini lake in Nainital, Uttarakhand, India.

Community based interventions for segregation, collection, recycling and treatment of Municipal Solid Waste: NGOs/CSOs based community interventions in segregation, collection, recycling and treatment can not only help in developing sustainable decentralised Solid Waste Management system, but also provide livelihoods to a number of families. This is

demonstrated through a case study of Exnora in Tamil Nadu.

Case Study 1: Community based interventions for segregation, collection, recycling and treatment of Municipal Solid Waste by Exnora

Solid Waste Management in Mudichur Village (close to Chennai), Tamil Nadu managed by M/s Exnora shows the efficacy of community based interventions in Solid Waste Management. The first site is based in a community of 4,500 Families. Around 450 kgs of solid waste is collected from this community every day. The second site is a group of 21 small town quarters. The waste collected from this Pammal Municipality in the zero waste centre reaches almost 4-5 Tonnes every day. In the first site, there is a collection station for both wet and dry waste, whereas at the second site, it is mostly wet waste that is collected.

Early each morning, a man on a tricycle rings a bell outside each door. Everybody now knows what this means: the waste collector is standing outside with his bike. Attached to the rear is a vehicle with two different types of buckets. The women know how to segregate the waste and where they must drop it, if not, they can always seek the help of the collector. After his first round, he brings all the waste to the specified area, where other team members, mostly women, are waiting to segregate the wet waste. At a second stage, other waste like paper, plastic and glass are segregated. The wet waste is then sent for composting and the dry waste sold to recyclers. The earning from this contributes to the maintenance of the waste station as well as paying the salaries of 22 workers. The scope for improvement and of up scaling up such an exercise is immense.

Source: Helga Weber, Best Practices for solid waste management, BORDA, http://www.borda-sa.org

Technology based interventions for Municipal Solid Waste Management: Geographic Information System / Global Positioning System based interventions can assist in efficient delivery of Solid Waste Management (SWM) services. This has been demonstrated by Pimpri – Chinchwad Municipal Corporation (PCMC) as described below.

Case Study 2: Monitoring of Solid Waste Management services through the use of ICT in PCMC

Prior to having the proposed Information and Communication Technology based Solid Waste Management system in place, the situation at PCMC was as follows: Monitoring of actual pick-up of the waste from the assigned bins/locality and the same was recorded purely on manual recording basis; Monitoring actual movement of the fleet and its productivity, i.e., number of bins picked up by each vehicle on schedule basis; Processes for validating the productivity of the fleet and payments were done purely based on manual records of number of trips made by each vehicle; Difficulty in tracking the non-compliance to the schedules; Difficulty in locating the bins in a manual process; Difficulty in monitoring actual pick up of the waste from the assigned bins/locality and dumping in the dumping yards and recoding of data is a manual process: Difficulty in preparing status reports, as it is a manual process and takes a lot of time.
Aim of the Initiative: In order to overcome the above mentioned problems, Commissioner, Medical Officer of Health and Computer Officer considered various solutions, like Global Positioning System based vehicle tracking system, Radio Freqency Identificationbased tracking of bins with respect to vehicles, Surveillance camera installed around bin location. The goal was to: Monitor real time movement of the vehicle and improve per vehicle productivity; Monitor the bin pick up adherence and improve city cleaning service levels and PCMC
Governance image: PCMC deployed Global Positioning System based vehicle tracking system due to low capital cost of deployment and ease of operation.
Implementation Strategy: A step by step implementation strategy was followed at PCMC.
Step 1: Selection of technology partner.
Step 2: Installation of Global Positioning system on waste collection vehicles.
Step 3: Geo Coding of bins across the city.
Step 4: Development of web based application and public information system.
Step 5: Stabilisation of system and training to stakeholders.

Brief on Solid Waste Management – 'Global Positioning System & Geographic Information System enabled': Geo coding (geo coordinates) of the all the bins (around 1279) across the city were marked on the Global Positioning System mapping database and real time vehicle movement (Global Positioning System location of the vehicle on which a Global Positioning System device was installed) were monitored against them as per route. Overall city vide 75 different routes were identified and geo coded with Geographic Information System map. An intelligence algorithm/logic was developed in web based application to flag the bin as 'Served', when a waste collector vehicle stops near a bin within a specified distance for a sufficient period. Using this data, a web based application was developed to monitor the waste pick up performance by

PCMC officials and an extended status view was also developed at the PCMC website for citizens to view the status (Bin served or not served) online for their own locality.
Key Contributors: Leadership of Pimpri Chinchwad Municipal Corporation; Departments and the employees; Implementing Agency
Achievements: By deploying the Global Positioning System based real time vehicle tracking system, PCMC is able to: Monitor the actual movement and real time position of the vehicle; Analyse the bin pick up status, such as bins picked up/served or not picked up/served in real time; Improve service delivery mechanism and achieve better information management; Ensure citizens' participation in governance and arrive at the performance level of each waste collecting vehicle; Reducing the unwanted trips/detours/stoppages and enhance the productivity/utilisation of the fleet; Generate MIS and exception report to take informed decisions; On the public service front, PCMC offered the 'Bin Pick up Status' over Internet to public website where any citizen can select its own locality bin and visually see the pick up status; Improve public image and also offered a tool for RTI; Timely completion of job with greater efficiency; Greater transparency in the civic administration; GPRS enabled mobile device for officers to track the service from anywhere and anytime; Measuring service level with benchmarks, making it compulsory for each ULB to achieve the benchmarks; Greater accountability of field level staff.
Lessons Learnt: Though there was a clear cut implementation strategy in place, a number of key challenges were faced, such as: Accurately geo-code all the bin locations of the city; Establish the intelligent algorithm/logic for flagging the bin served/un-served and Initial resistance from operative staff on deployment of such technology.

Principles for Public Private Partnership (PPP): Public Private Partnership (PPP) is essential for effective management of municipal waste. The study did not find a single city that was able to manage their waste effectively through Municipal staff alone. It has come up with fifteen important principles that have to be taken into consideration while doing so:

PPP Principles	Why is it essential?	How can it be done?
PPP Principle 1: Appoint an independent private agency for construction waste and for bulk waste producers	It is critical not to let debris/construction waste and the waste from bulk producers to get mixed up with normal domestic waste. This is best done when a separate agency is appointed to collect and transport (and where possible, process) this waste. The timings for collection of waste from bulk producers also has to be different (hotels are best tackled after midnight, markets may require multiple clearance during the day).	Municipal Bodies should award rights for collection and transportation of debris/bulk waste to contractors. The contractor for debris may be allowed to charge the generators at a predetermined rate. The contractors can also be allowed to 'sell' such debris to other sites that require land filling. Debris may also be used to fill low lying areas (or where mosquito breeding takes place), prepare playgrounds, etc. Payments for bulk producers can be on the basis of number of beds/rooms, area etc. This is simpler to enforce and does not provide any incentive for waste generators to dispose off waste in any other manner. Do not allow charges to be levied on weight basis. Charges to be collected directly by the agency. More stringent norms for segregation may be imposed on bulk waste generators. Where possible, separate processing of waste collected from bulk producers should be done.
PPP Principle 2: Give house-to-house collection contracts to NGOs or SHGs	In most cities, where solid waste management services are contracted, the work gets awarded to relatively big firms following a normal tendering process and the bids are decided on the basis of lowest quoted rate. This disincentives waste reduction at source and also eliminates urban poor from getting employment benefits in the process.	With a deficiency of trained people to handle house to house collection accompanied by segregation, cities can gain by utilising the expertise of rag pickers for this work. The informal sector can be placed at the beginning of collection chain rather than being at its fag end. They can be 'employed' to carry out house to house collection of segregated waste, so that they do not need to rummage for recyclables through mixed waste at community bins and processing sites. Cities can give priority to cooperatives of rag pickers/women groups under SJSRY while awarding such

PPP Principles	Why is it essential?	How can it be done?
		contracts. Conditions to wear uniforms, carrying identity cards, giving attractive designations ('*Swachata Doot*' in Nagpur) helps in giving them the requisite status and place in the society. The agency should be allowed to sell recyclables and to collect a part of their 'remuneration' directly from the generators. They could be allowed to convert bio-degradable waste into manure at a suitable place in neighbourhood gardens and allowed to sell the same. Formation of larger groups could be encouraged by giving contracts to NGOs, which employ such deprived sections of city population.
PPP Principle 3: Give comprehensive contracts	Instead of handling a plethora of small contracts, the local body should try to give comprehensive contracts. This reduces the managerial burden on the Municipal body considerably. Also, this monitoring is directly related to the final objective with which the contracts were given, i.e., to keep the city clean. Only a comprehensive contract can allow the community bins to be eliminated.	The contracts should ideally require the contractor to collect segregated waste from each household and transport the same to the processing site. Where possible, the contractor should also be required to sweep the roads as well as keep a given locality clean (including gutters, *nallahs*, open public places). The contractor, in such cases, ensures that households hand over waste to his staff directly and do not dirty the roads and open places. The contractor can also be given the right of enforcement of the specified procedure to hand over waste. He can be given pre-printed and numbered receipts of fixed denominations that he can issue, while collecting the fines. A part of this collection can be allowed to be retained by him.
PPP Principle 4: Contracts to be performance oriented Pay for outputs and not for inputs	To ensure that the system works efficiently, it is essential that contracts are performance oriented, or output based. In a contract, the basis of payment determines what gets monitored and, therefore, what gets done. This could be on one of the following basis: i) weight/container basis ii) household basis iii) lump-sum with performance indicator basis	Many cities have given contracts, which require a certain number of labour or vehicles to be provided, trips to be made between certain hours etc. This is an incorrect practice. The contracts should invariably be output based. This can be based on collecting the waste from door to door and keeping a given locality clean. Freedom should be given to the contractor to decide how to do the assigned work. This would give him scope to improve efficiency and thus bring down costs (which finally get passed on to the local body). The payment to the operator should usually not be on weight basis. In this case, the operator has no incentive to reduce waste through segregation. It would, in fact, provide an incentive to discourage segregation and even bring debris, etc. to get more payment. Payment on weight basis could, however, be ideal when differential payments for mixed and segregated wastes have been prescribed. The operator can be allowed to bring unlimited quantity of segregated waste, but only a limited quantity of mixed waste to the processing site. Any additional quantity could attract deductions in payments. In all other cases, the ideal system would be to pay a fixed amount for a certain specified job with an effective system of daily monitoring. This monitoring could be done by an area committee with representatives from residents as well as the elected members.

PPP Principles	Why is it essential?	How can it be done?
		Payment on house hold basis seems to be an acceptable basis, especially when the operator is engaged only in door to door collection and is allowed to collect a part of the charge directly from the households.
PPP Principle 5: Allow Contractor to provide his own vehicles	Municipal bodies should avoid purchasing transport vehicles. Fleet utilisation is more efficient when vehicles are maintained through private operators.	It is important that the operator has a financial stake in the contract. Capital investment in tools and equipments should, therefore, be part and parcel of outsourcing. The operator has to recover the cost of assets provided and, thus, optimise investments and maintenance of assets. Thus, Municipal bodies should obtain services of waste transportation by a contract, where the contractor engages his own vehicles. Even where vehicles are owned by the Municipal body, they should invariably be operated by an agency under a contract. The contractor can deploy his own staff, fuel and carry out repair and maintenance of the Municipal vehicles. The vehicles can be returned to the Municipal body in good condition at the end of the contract. Periodical inspection can be carried out to avoid any misuse. The period of the contract should be such that it provides adequate time for the contractor to recover the investments made. This is ideally three years when Municipal vehicles are provided and 5-7 years when the agency has to provide vehicles/community bins.
PPP Principle 6: Let the Contractor be responsible for Labour Laws	The responsibility of compliance with the labour laws should be fully and squarely be that of the contractor/agency.	Municipal bodies must ensure that only contractors registered with labour Department are engaged. This ensures that it is the responsibility of the contractor to provide necessary facilities to the workers as per the Contract Labour Act, 1970 and other labour legislations. The contractor should also ensure payment as per the Minimum Wages Act, 1948. The contractor cannot employ staff under 18 years of age. The workers must be given identity cards, as well as two sets of uniforms, gloves, masks, boots, raincoats, etc. The contractor should keep the Corporation indemnified in respect of all claims and should insure all the workers as well as equipments.
PPP Principle 7: Engage a private operator for waste processing	Waste processing is a capital intensive activity. Moreover, it employs complex technologies and plants are difficult to be operated efficiently by Municipal staff. Waste processing facility should be provided and run by a private operator.	The work of waste processing has to be entrusted to a private agency. Ideally, this facility should be erected and maintained by the operator. It is cumbersome to enter into contracts with private operators, who have not invested their own funds to set up such plants, without the risk of plants being mismanaged or not being maintained in best possible manner.
PPP Principle 8: Do not get bogged down by technology	The technology keeps on evolving. What is acceptable today may soon become outdated tomorrow. Municipal bodies should avoid getting attached to a particular technology.	In certain cases, like for composting/biogas plants requiring smaller investments, Municipal bodies may consider creating a facility from public funds and hand it over to a private operator for day to day operations. The operator has to accept all Municipal waste (except hazardous and bio-medical waste, which has to go to land fill/separate processing facility) and Municipal body should pay the operator a

PPP Principles	Why is it essential?	How can it be done?
		tipping fee for the waste accepted. A penalty can be levied if the operator fails to accept all the waste offered. In certain cities, the city managers are seen to be inclined to adopt a particular technology for processing waste. This is acceptable for low cost technologies, like vermi-composting/bio-gas etc. Municipal bodies should, however, not themselves get involved in selecting the technology employed to process waste where expensive technology for converting waste to energy is involved. The objective of the Municipal body should be to get waste processed in the most cost effective manner and by using a technology that is in compliance with the law. Let the technology be decided by the operator and the State Pollution Control Board. The permissions for the processing plant can be taken by the private operator from MPCB. The operator must also be made responsible for updating the technology as required by the rules from time to time.
PPP Principle 9: Enter into a right contract	Waste processing is a long term agreement. The following need to be given special attention: Consider the option of the operator providing his own land for setting up the facility. Payments may be such that the municipal body/collection agency has an incentive to bring segregated waste. Payments to processing operator should depend upon the quality of waste disposed. There must be built in incentives to ensure proper processing of waste and minimum rejects being generated.	Private operators are willing to provide their own land for setting up a processing facility. The requirement of land and cost of transportation is a small proportion of total cost of waste processing. Thisalsoallowscontractswithmorethanone operator and for shorter durations. It also makes the entering of the contract as well as its termination simpler. The operator can also have the freedom to process waste from adjoining cities. Payments may be made on the basis of tonnage disposed. The charges should be based on the type of waste going to the landfill site – it should be different for segregated and mixed garbage. Simultaneously, the agency undertaking waste collection and transportation could be paid an incentive for bringing segregated waste. Alternatively, he could be allowed to bring unlimited quantity of segregated waste, but only a limited quantity of mixed waste. The contractor be liable to a 'tipping fee' for the quantity over and above the free limit. This free quantity of mixed waste could gradually be reduced on a month-to-month basis. The responsibility of mutually resolving the quality of garbage may be between the two operators – one transporting waste and the other processing this. Disputes could be resolved by the Municipal body. The responsibility of using the rejects for land filling could be that of the operator. However, where the land fill site is managed separately from the processing plant, a tipping charge could be charged for the rejects beyond a maximum permissible quantity. Similarly, transportation of rejects could be the contractor's responsibility. However, it may be difficult for the operator to find a scientific site for landfill of ash/rejects after treatment and he may resort to unscrupulous dumping. To prevent this, Municipal bodies could allow rejects to be land filled on its site on

PPP Principles	Why is it essential?	How can it be done?
		collection of suitable tipping charges. A part of the sanitary landfill could be reserved for the residue from bio-medical waste treatment and its tipping charge should be higher.
PPP Principle 10: Do not get involved in sale of compost/products.	Sustainability of composting and other similar projects depends upon regular sale of the compost/products. Municipal bodies should not take up the responsibility of such sales. Such compost should meet the requirements of farmers. A constant control of quality is a must. Prices have to match the demand as well as quality.	The operator should be allowed to sell the power, compost or any other material produced after processing. Some Municipal bodies have got involved in the sale of the compost and other produce, and the results have been disastrous. On the other hand, Municipal bodies that have left this to be handled by the private operator, are doing very well. A private operator can price the manure to suit the demand and the quality. The Municipal Bodies are not equipped to sell manure and fertilisers and should, under no circumstances, undertake this activity on their own. The operator can supply certain quantity of compost to Municipal body for city gardens. Also in most cases, the operator may pay some royalty to Municipal body. This is especially so in case segregated waste is supplied.
PPP Principle 11: Do not forget Carbon Credits.	The possibility of generating revenues from the processing and reduction of waste should be explored or the option kept open.	Carbon credits may be a very attractive way to finance scientific processing of waste. This is specially so with the signing of the Kyoto Protocol under which tradable carbon credits have become available. Even when uncertainty exists, the operator can be asked to do the spadework for the same and a clause to share the rights in the future in case they become available should be retained in the agreement.
PPP Principle 12: Bio-medical waste to be handled only on PPP Model. Allow operator to service generators outside City limits.	The technology to process bio-medical waste is complex and requires constant updating and certification from competent authority. The operation is expensive and requires trained manpower. The Municipal bodies should, therefore, not take upon themselves the responsibility of setting up and managing their own plants.	Biomedical waste could be best handled by private entrepreneurs through Build Own Operate / Build Own Operate & Transfer contracts. There are enough private enterprises waiting to undertake such contracts. The operator has to collect, transport, treat and landfill the waste as per the prescribed rules. The license to operate the Municipal Solid Waste Facility and Bio-medical Waste Treatment Facility of an area should be given to separate operators in order to avoid mixing of wastes. License for bio-medical waste plants is valid for three years and, hence, Bio Medical Waste contracts for a short period are advisable. A 3-5 years contract is found to be ideal. Contract for too long a period like 30 years should be avoided. This makes entering into a contract and its termination simpler. This is especially so when the land for the facility is owned by the operator. Wherever feasible, an exclusive right should not be given to one operator to collect bio-medical waste. The possibility of more than one operator should be explored. Competition can ensure better service at lower cost. The urban local body should also allow the operator to collect BMW from the adjoining cities. It not only provides a facility for smaller towns,

PPP Principles	Why is it essential?	How can it be done?
		but also helps in sustaining the project. It also gives the operator an opportunity to cut down his costs and, thus, provide services to the city at a lower cost. A higher royalty could be charged by the city where public lands have been provided for servicing the areas outside the city limits.
PPP Principle 13: Involve medical practitioners / waste generators in selecting the operator.	The facility exists to serve the medical practitioners in the city and their active involvement is a must for successful operations.	Projects where medical practitioners themselves initiate the process of selecting the private operator are more successful. Operators selected with their involvement are able to cover all of them without the Municipal body having to exert any regulatory pressures. Also, the medical fraternity is most interested to ensure quality service and is, therefore, better able to take corrective steps without loss of time. The tendering procedures can also be simpler since the agreement is between private parties. In case the Municipal body is not involved in fixing the rates, the operator could be finalised without issuing tenders. This is especially useful where there are not many interested entrepreneurs (especially in smaller cities). An advisory committee should be appointed to guide and supervise the activities and meet once every month and decide all matters by simple majority.
PPP Principle 14: Prescribe agreement between Generators and Operator.	An agreement between the operator and the generator should be prescribed. This is essential to enable the generators to have a control over the quality of service provided by the operator.	An agreement should be signed between the operator and the generators. Municipal bodies can mediate between operators and generators. It can help operator to recover dues from the generators, as also help generators if the operator does not give satisfactory services. Suitable penalty could be levied on the generators for not giving timely payment and may lead to suspension of services/report to the urban body. Similar charges can be prescribed for the operator for not collecting the waste on time, for not managing the waste as per rules, or for not keeping his pollution control board permissions intact. Colour coded bags can be supplied by the operator on cost basis. The Generators should have an option to procure their own rule compliant bags. The operator should be required to provide training to the hospital staff to segregate the bio-medical waste as per Rules.
PPP Principle 15: Service charges should not be on weight basis. Allow direct collection of service charges.	The basis of charging of the medical practitioners should be such as to provide incentives for correct practices.	Rates should be charged on per bed basis. Payment on weight basis is found to create problems. It is better to have payment on bed/fixed basis. so that the generators do not have any incentive to minimise their costs by illegally selling/disposing off their bio-medical waste in Municipal bins. It might also lead to Bio-Medical Waste being sold to *Bhanggaarwala*. The Municipal bodies should ensure direct collection of service charges by the operator. Collection of the charges by Municipal body can create several problems. The Municipal bodies may not approve of increase in the rates and the collection could be inefficient.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005

Direct collection of organic content rich waste going into community bins to process it to generate compost can assist to minimise Municipal Solid Waste: Direct collection and processing of hotel waste can assist in reducing Municipal Solid Waste coming into Municipal bins as well as generate rich compost for usage as soil conditioner. This has been demonstrated by Nagpur Municipal Corporation as given in the following case study.

Case Study 3: Nagpur Municipal Corporation has devised a system to directly collect waste generated at hotels.

The waste is separately collected so as to minimise waste going into community bins and also to process it to generate compost. Nagpur Municipal Corporation initiated this process in July 2001. The Corporation also levies service charge for collecting waste from hotels.
Situation Before the Initiative: There are about 939 hotels and 204 marriage halls and lawns in Nagpur city. Earlier waste by these bulk waste generators was dumped into community bins in the city. In this process, the bio-degradable waste was getting mixed with other types of waste generated in the city. This also resulted in cattle and pig menace around the community bins. Stink also emanated due to the food waste deposits in the bins.

Description of the Initiative: The Corporation decided to directly collect the waste from these hotels. The Corporation conducted a meeting with the hotel owners in the year 2001. The scheme to directly collect the waste and the service charge that would be levied was presented to them once. The hotel owners gave their consent and the scheme got initiated. The Corporation has deployed two trucks, which move between 9 amto 4 pmto collect the hotel generated waste. The route and timings of both the vehicles are fixed. One driver and three labourers are deployed on each vehicle on daily wage basis. Out of a total of 1143 establishments, presently around 400 are covered under the system. The waste from the hotels is collected on daily basis. The marriage halls, lawns, etc. have to inform the Corporation about each programme in advance. The Corporation is charging the waste generators on the basis of their size and occupancy. The rates charged are as follows:

Hotels with residential facility: Rs.1000/- per month
Hotels without residential facility, but having adequate business: Rs.500/- per month
Small hotels: Rs.300 per month
Marriage halls, lawns etc.: Rs.300 per programme

The biodegradable waste, thus, collected is processed separately. The Corporation has earmarked a separate area (100x75 feet) within landfill site, where 20 beds have been built to process vegetable and hotel waste into vermi-compost. The site is managed by a Non Government Organization i.e. (Gram Samrudhi Sanstha).
Benefits: The Corporation could directly collect bio-degradable waste from 35 percent of the food waste generators in the city. This helps in reducing the amount of waste falling in community bins. The bio-degradable waste can be directly used for preparing the vermi-compost without extra effort of segregation. It has helped in controlling cattle and pig menace and bad odour from community bins.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005

Service charges can assist to manage Municipal Solid Waste and ensure cleanliness: Horse dung management on a hill station through levying of service charges can ensure sustainability of services and cleanliness in hill stations. Matheran is probably the only place in India where automobiles are prohibited inside the town. As per the rules mentioned in the Central Government Matheran Eco Sensitive Zone notification, "Use of motor vehicles other than ambulance, fire brigade, tractor and trolley for solid waste are prohibited." This implies increasing use of horses for transportation. Vehicles are restricted up to Dasturi Naka, which is two kms from the town. The mode of transport or conveyance within the town, therefore, is restricted to horse rides or hand pulled rickshaws. Naturally, the surrounding gets littered with horse dung creating unpleasant sights. Hence, Matheran Municipal Council included the collection of horse dung from major roads and public places in the contract of the private operator appointed for one year for door-to-door collection, transportation of solid waste from residential, commercial and public places.

Description of the initiative: Due to ban on motor vehicles in Matheran, the modes of transport are limited to horses and rickshaws

(pulled by humans). There are 465 horses for ferrying the tourists and nearly 150 horses for goods transportation in Matheran. These horses generate about 2-2.5 tonnes of dung. Wastes and horse dung generated in Matheran are substantial and hence suitable arrangements have been made to collect them from the roads between 6 am to 9 pm. The Matheran Council has appointed a private operator on contract basis for regular collection of horse dung on major roads to maintain clean look of the city. The private operator has deployed a team (except during rainy season) for regular collection from major roads covering a distance of about 4.5 kms.

Charges levied: A service charge of one rupee per day per horse is levied for collection of horse waste.

Penalty: It is the responsibility of the appointed Health Officer to monitor the cleanliness of markets, roads, and public places. As per the rules mentioned in the agreement, penalties are levied on the erring contractor. The rules are as follows:

System Penalty value

1. For not cleaning specific roads Rs.200/- per occurrence
2. If labourers are found without uniforms Rs.50/- per occurrence
3. For not carrying the necessary equipments Rs.50/- per occurrence required for collection and transportation
4. For not paying the wages to the labourers; the salary of the labour plus 25 percent

Results achieved: The Municipal Council appointed a contractor to collect horse dung daily from 6 am to 9 pm. This has reduced the burden of work and labour cost for the Council. A sum of Rs1.39 *lakhs* is collected annually from the horse owners by the Municipal Council, which covers expenditure on horse dung collection. Horse dung on major roads is collected and transported to the appointed site and hence the town remains free from ungainly sight of surroundings littered with horse dung.

Transferability: The practice is definitely transferable to other cities. Tailor made solutions are necessary for specific sources of municipal waste, rather than a one-for-all solution for all types of waste.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Payment for debris management services to the contractor and penal provisions for the waste generator for managing Municipal Solid Waste: A combination of penal provisions enforced on the generators and payment for services can ensure debris management and cleanliness in the city. This has been demonstrated by Nagpur Municipal Corporation as described below.

Case Study 4: Nagpur is one of the few cities in Maharashtra to device a mechanism for collection of construction waste and using it as landfill.

The Corporation has contracted the work to a private agency for a period of one year and also made provisions to charge a fee for this service. The construction waste is directly taken to low-lying areas pre-identified by the Corporation to prevent accumulation of water in such areas. The initiative helps in clearing construction waste whenever it is found on roads, footpaths and other public places. This helps in keeping the city clean and prevents nuisance from unclaimed construction waste lying on the roads for indefinite period.

Situation Before: The Nagpur Municipal Corporation was facing problems in managing the construction waste produced in the city. It is the duty of the generators to keep the waste within their premises and send the same for landfill at their own cost. However, the Corporation observed that the debris, sand, earth, bricks, building materials, etc. were being dumped on the roads, footpaths and other public places without the permission of the competent authority. This caused hazards to the traffic and the pedestrians and also resulted in unclean roads and streets. With a large number of new buildings coming up in the city, this nuisance was continuously on rise.

Description of the Initiative: Nagpur Municipal Corporation decided to solve this problem by assigning the job of lifting and landfill of such waste to a private contractor. The scheme was started in the year 2003-04. A private agency having required vehicles like tippers, excavators, etc. was given the contract by the Corporation for a year for lifting and land filling construction material. Any material including debris, sand, earth, bricks, building material etc. dumped on the roads, footpath or in any public place without the permission of the competent authority and causing hazards to the traffic or

cleanliness is lifted through the operator. The staff of the Health Department identifies the areas where the construction waste is lying. The generator is given a notice to clear the waste within a specified time period. If there is no response from the generator, the contractor is informed and the material is lifted and sent for land filling the low lying areas identified by the Corporation. The contractor produces the weight receipt for the payment of the bill to the Corporation. The Corporation charges an amount double the actual cost incurred on lifting the waste to the generator. There is no direct tie-up between the contractor and the generator.

Salient features of the contract: The payment is made on per tonne basis with a maximum of eight tonnes per vehicle per trip only. No payment is made for more than eight tonnes per vehicle per trip. In case of weight less than eight tonnes per vehicle per trip, the payment is made on actual weight basis. The contractor has to pay income tax on all payments made under the contract (other than reimbursement of minor dues, which the contractor may make on the Corporation's behalf). Cost of any damage, injury or death caused by contractor's vehicle (including Corporation's vehicles handed over to contractor) or any claim arising out of it is recovered from contractor through bill. All costs, charges and expenses incurred in connection with this contract including stamp duty and all other disbursements are borne by the contractor. A penalty of Rs. 500/- per trip per vehicle is levied if contractor's vehicle does not unload at the appropriate place and as per the instructions at the landfill site. A penalty of Rs. 1500/- is levied in the event of a breakdown of the vehicle before starting of work and failure of contractor to make alternate arrangement. In case of breakdown after starting the work and failure of the contractor to make alternate arrangement within three hours, the corporation makes necessary arrangement at the risk and cost of the contractor plus 15 percent supervision charges, in addition to a penalty for non-supply is levied as per clause. In case the contractor fails to supply vehicles with tipping arrangement indented within the specified period, a penalty equivalent to amount of Rs 150/- is charged for the short supply of first vehicle and thereafter Rs 100/- for short supply of every additional vehicle. A penalty of Rs.100/- per vehicle per shift is levied if the contractor fails to provide 'on Municipal Duty' sign board on vehicle. Nagpur Corporation is one of the few cities to start a mechanism for collection and landfill of construction waste in Maharashtra. Nagpur Corporation charges an amount double the actual cost incurred on lifting the construction waste from the generator.

In case the contractor fails to route the vehicle through check point, a penalty at Rs.500/- per trip per vehicle is levied. In case the contractor fails to properly load the vehicle even after redirecting him and reports again to check point with under loading more than 10 cu.m, a penalty of Rs.500/- is levied. The contractor shall on or before the eighth day of every month present to the respective Department the bill in triplicate for all work carried out under this contract during the preceding month, failing which a penalty of Rs.50/- is levied for each original bill if there is a delay in submitting the same to the Department. The practice is very much transferable as is evident in its successful replication in cities like Kamptee, Pune and Pimpri Chinchwad.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Start with a small area for door to door waste collection: Implementation of door-to-door waste collection may start by covering a part of the city. For example, when Nagpur initially started door to door collection, only 40 percent of the city was covered initially. Looking at the success, around 150 households from the Doctors' Colony, not covered under the project, requested for similar service to be provided in their locality. They agreed to pay Rs. 30 per month to the contractor.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Set up purchase centres for dry waste for waste minimisation: Reduction of Solid Waste Management is also possible by setting up purchase/processing centres for dry garbage, like plastics, paper, etc. Such centres also ensure that the recyclable material is sold through properly created channels to ensure that the recycled goods are not misused. For example, Mahabaleshwar Municipal Council collects plastic bottles and prepares granules using a crusher availed through people's participation; Savantwadi Municipal Council has set up an old clothes sale-purchase centre; Pune Municipal Corporation has started collecting segregated waste from the doorstep in some areas and processing wet waste. It has also set up dry waste sale-purchase depots, thus achieving waste minimisation.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Composting technologies as technological options for Municipal Solid Waste management in India: Organic matter constitutes 35-40 percent of the Municipal Solid Waste generated in India. Composting is the controlled decomposition of complex organic materials by micro-organisms, such as fungi and bacteria that convert degradable

organic waste into humus like substance. This finished product, which looks like soil, is high in carbon and nitrogen and is an excellent medium for growing plants. Apart from being clean, cheap and safe, composting can significantly reduce the amount of disposable garbage. The organic fertiliser can be used instead of chemical fertilisers and is better, specially when used for vegetables. It increases the soil's ability to hold water and makes the soil easier to cultivate. It helps the soil retain more of the plant nutrients. Although decomposition occurs naturally, composting facilities are designed to speed the rate of biological decomposition by managing key parameters, including moisture content, oxygen, temperature and the ratio of carbon to nitrogen.

Aerobic Composting employs oxygen as part of the decomposition process. Composting facilities use two basic methods to introduce air. Windrow systems: In this type of facility, material is composted in long piles (windrows) on a flat site. Windrows are kept porous mechanically by turning the material periodically. If piles are not turned often enough, the centre of the pile may not receive enough oxygen, producing strong, unpleasant odours. Aerated static pile systems: In this type, air is introduced into a large pile through air duct systems installed beneath the base of the pile. Aeration can be positive, blowing up through the pile; or negative, drawing air down through the pile. Negative aeration has the added capability of exhausting the processed air through odour scrubber systems when necessary. In general, aerated static pile systems have higher capital costs, but lower overall operating costs than windrow systems. The turned-aerated pile systems combine both of the above technologies for more consistent process control and product quality.

Vermi composting: This uses worms to achieve controlled composting of organic wastes. Worms digest organic materials. In addition to significantly reducing the quantity of waste material, the end product can be used as an organic fertiliser. Compared to other composts, this has a finer texture, does a better job of enhancing the soil, have typically higher levels of nitrogen, potassium and phosphorous, and have more micro-organisms to fight diseases in plants.

Anaerobic digestion: This is a biological process that occurs in the absence of oxygen. Anaerobic processes can either occur naturally or in a controlled environment. The organic waste is put in an airtight container called a digester where decomposition begins and the biogas is captured and sold for electricity. The residue can be used as a fertiliser similar to compost.

Green waste composting: Green waste consists of leaves, brush, tree trimmings, grass, garden waste, shrubs and materials generated by nurseries, public gardens, and individual citizens. Green waste usually does not require much pre-processing to remove contaminants. Only impurities such as plastic bags, wire or rope may be removed by hand. Reducing the size of brush and tree trimmings facilitates handling and speeds the composting process. In addition, the harder, more uniform wood also helps aerate the piles, thereby enhancing decomposition. The composting process can be further enhanced if leaves are also pre-shredded. The nutrient level in green waste is generally high and it is marketed easily.

Mixed solid waste (MSW) composting: Paper, food scraps and green waste make up the compostable portion of the mixed Municipal solid waste. However, mixed waste also includes non-biodegradable items, such as plastics and metals. The quality of the compost product will depend on the degree to which non-compostable items are removed in the process. Generally, separating contaminants early in the process results in the production of higher quality compost. Material Recovery Facilities allow to process mixed Municipal solid waste to recover recyclable materials. This is done in various ways. The simplest consists of conveyors systems from which useful material is picked up through manual labour. More sophisticated facilities use shredders, conveyors, screens, and magnets to separate components of the waste. Some

facilities also use devices that use forced air to separate the light burnable fraction from the remaining inert material. Computerised equipment is sometimes used to recover and segregate aluminium, paper, glass, and plastic. These are all expensive. The best solution is to get segregated waste for processing. Composting technologies have an added advantage of producing fertilisers, which can be conveniently sold to nearby rural areas. The composting technologies can create large scale employment in the urban areas, without putting any financial burden on the city administration.

The nearby rural markets can provide a ready market for the sale of fertiliser produced through composting and other methods. Vermi-composting is also one of the most cost effective methods for processing Municipal Waste. While bio-methanisation and other similar technologies would cost in the range of Rs. 200 to 300 *lakhs*, vermi-composting would cost just Rs. 20 to 30 *lakhs*. Moreover, very small sized plants are possible while the minimum viable size for 'modern' technology options is 60 TPD of segregated organic waste. For example, Kalyan has constructed a facility for the processing of biodegradable waste collected from vegetable markets, hotels and marriage halls. This is run by an NGO i.e. *Stree Mukti Sangathan*. An advance of Rs one *lakh* was given for procurement of equipments and wages. The workers segregate plastics and other non-biodegradable material before spraying the waste with a culture and water. NGO has refunded the advance from the Corporation. Similarly, Bhopal Municipal Corporation has set up a bio compost plant to treat around 100 tonnes rich organic waste from weekly *haat*, bazaars and *sabzi mandis*. An operator is responsible for running the plant and the sale of compost. The Corporation receives four percent royalty every three months (between Rs. 20,000 and Rs. 40,000) on the sale of compost. Many small cities in Maharashtra have similarly set up small composting plants (e.g. Ashta, Islampur, Phaltan, Kagal, Chalisgaon). In some cases, the capital cost is incurred by the Municipal body while operation and maintenance has been handed over to a private operator. Such arrangements seem to be working better as compared to running of plants through Municipal staff. Puri, being a religious town, hosts a number of festivals, which attract huge crowds. This floating population produces substantial waste. The city set up a bio compost plant under Indo Norwegian Development Corporation support. A private firm operates the plant and sells the organic manure. The city earns royalty from the sale of compost. The pressure on the landfill site has considerably decreased.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Awareness creation for Municipal Solid Waste Management: Dedicated participation of elected and administrative wings is crucial to educate people about keeping their city clean. Involvement of senior citizens and respected and popular members of the community would certainly help. Involvement of various groups of people, like resident associations, trade associations, shopkeepers associations, youth groups, NGOs, CBOs, religious groups etc. is also essential. Special emphasis needs to be given to involvement of housewives, maid servants, watchmen of housing societies, sweeping staff, etc. while creating awareness. Conducting regular meetings, workshops, group discussions and rallies, street plays, *Rangoli* competitions, essay writing, drawing competitions, etc. are seen to be very effective. Mass awareness could also be created through public notices, sponsored advertisements in local newspapers, theatre halls, cable TV and such other mediums. For example, Matheran Council and Matheran Bachav Samiti together prepared a detailed plan for waste segregation at source, door to door waste collection and recycling; Virar and Panvel Municipal Councils organised workshops for Corporators, NGOs, industry and business communities, etc. to undertake Solid Waste Management planning. Thereafter, a working group was formed to take forward the process. Pune started public awareness campaigns through schools and colleges for giving segregated waste only. Also, it organised *Rangoli* and essay competitions. Singapore uses an innovative system to create

awareness amongst tourists, school children and local people by organising shows in various tourist destinations, like night safaris, bird parks etc. for stopping littering of waste. Awareness campaigns are being taken up in Bangalore through participation by the Corporation, Bangalore Agenda Task Force, Swabhiman and other NGOs.

Awareness creation through school children: Another important means of creating awareness is to educate the school children about keeping their households and colonies clean. School children are the best messengers for spreading awareness among their parents. For example, in Kodagu (Coorg) district of Karnataka, a very successful drive required school children to bring all the dry recyclable waste from their homes to the school (plastic bags, rags, glass) once a week. Thereafter, class-wise sale to *kabadi-walas* is organised every week and the funds are used for Eco-Club activities. This has resulted in substantially increased segregation of dry and wet waste in the town. Panvel Municipal Council supported their drive of door-to-door collection and elimination of community bins with the help of students. They stood near the bins to educate and politely dissuade people from throwing garbage into them.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

Case Study 5: Integrating informal sector/rag pickers into Municipal Solid Waste management system in Maharashtra

While, Municipal authorities view waste as a health and environmental hazard that needs to be got rid of, the informal sector treats the same as a raw material. Rag pickers retrieve recyclable materials, like plastic, metal, rubber etc. from the heaps of garbage or municipal bins to sell it to the bhangarwala to eke out a meagre living. It is estimated that these waste pickers pick up about 10 to 15 percent of the total waste produced in cities and pass it on to the industry through various intermediaries.

Presently, some Councils allow such groups to operate in the processing sites and housing societies. However, it is common to see them work under most inhuman condition rummaging through mixed garbage with bare hands. This is very detrimental to their health. It also causes environmental degradation as they pick up the recyclables and leave the unwanted garbage on roads and footpaths. At the same time, the Municipal Solid Waste Rules are forcing Municipalities to clean up the city. While the required compliance with the rules makes it essential to look beyond the Municipal staff for this work, and there is no attempt to integrate waste-pickers into this process.

The contractors often find unemployed youth for this work; thus displacing the poor waste-pickers from the only livelihood they know. Nashik, for example, has contracted out garbage collection through tractor trolleys using other hired labour, in the process rendering 1000 waste-pickers destitute.

On the other hand, there is a great deficiency of sufficient trained people to handle house to house collection accompanied by segregation of waste in every city. Hence, there is all the more reason to utilise occupational expertise of rag pickers for this work. They need orientation towards scientific handling of wastes, while, at the same time, improving their working condition.

These very rag pickers can be very efficiently deployed to process the Municipal waste. This has been very well demonstrated in Kalyan- Dombivali. They can be trained to run the bio-gas plants being run on Municipal waste. There are organisations that are making this possible. The need is for the Municipal bodies to give them the right place in the efforts to keep their cities clean.

Quantum of Waste collection by Rag Pickers: A study has shown that, on an average, 37 percent of the rag pickers collect 6-0 kilograms of waste per day, while 60 percent of the rag pickers collect 11-20 kilograms of reusable wastes. Only 1.6 percent collected in the range of 21 to 30 kilograms of reusable waste. Taking an average daily collection of 10 kgs, the estimated 85,000 rag pickers in Mumbai collect approximately 850 tonnes of recyclables! This is equivalent to the quantum of waste generated by 1.9 million Mumbaites. This is also about 20 percent of all the waste collected daily in the city. The landfills would have exhausted much faster had they not done so. These rag pickers also reduce the burden of Municipal bodies in collection, transport and disposal costs. The contribution of these rag pickers is also equally important in terms of the reduced consumption of raw materials, such as petroleum products, trees (for making paper), metal ores etc. Also, with an average rate of Rs 5-6 per kilogram, the waste recycling business is worth Rs 200 crores in Mumbai alone.

Getting them a better deal: Ignorance, illiteracy, inability to collaborate among themselves, absence of an organisation and

often heavy indebtedness to middlemen for loans at high interests to obtain seed money - all these factors combined together - create a weak bargaining situation, in which the rag pickers are the inevitable losers. An effort to organise them is a difficult task, but still quite a few successes have been achieved. Experiments from across the country have demonstrated how small groups of waste collectors can be organised to undertake waste recycling activities themselves and through it, not only increasing their returns, but adding a new dimension to their occupation. Most such initiatives focus on eliminating the role of middlemen by selling the collected recyclable waste directly. Some such groups even take up the recycling activity themselves, although on a very small scale. Kagad Kach Patra Kashtkari Panchayat (KKPKP), a cooperative society of the waste pickers in Pune has successfully organised about 5000 waste pickers and is collecting more than 200 metric tonnes of recyclable waste every day. KKPKP runs a credit society and a scrap cooperative, both of which are now financially viable. The Self Employed Women's Association (SEWA) in Ahmadabad has provided support to the waste pickers in accessing the waste papers from mills in the city. Exnora in Chennai, Chintan and Vatavaran in Delhi; Nav Bharat Jagriti Kendra in Ranchi; CDC in Jaipur, Stree Mukti Sangathan (SMS), Force and Apnalaya in Mumbai have come a long way in bringing the waste collectors in the main stream of Municipal solid waste management. In some cases, the NGOs were able to get support from the concerned Municipal bodies. In Pune, for instance, a medical insurance scheme has been started, where the annual premium is paid through the Corporation's budget.

Stree Mukti Sanghatana has organised over 2000 rag-picker women into around 200 groups. Recently, a separate organisation - Parisar Bhagini Vikas Sangh - has been registered as a federation of these groups. Four cooperative societies of 50 women each have also been registered to undertake various contracts for composting, cleaning, house to house collection, etc. These women are given training in composting, gardening, maintenance of bio-gas plants, etc.

The movement can only get stronger with support of all Municipal bodies. And it can be a win-win situation. The rag pickers can provide a cheap and convenient means to collect segregated waste from house to house. They can also help in forcing the generators to separate out the dry and wet garbage. They can run small vermi-composting projects and bio-gas plants on self financing basis and earn a living from it.

Source: Compendium of Best Practices Municipal Waste Management, Volume 2, City Managers' Association of Maharashtra, 2004-2005.

A comprehensive Solid Waste Management contract to a contractor can assist to address Solid Waste Management in a Municipality. This is demonstrated in the following case study.

Case Study 6: Solid Waste Management 'Comprehensive' Contract in Ulhasnagar

Ulhasnagar Municipal Corporation has given out a comprehensive Solid Waste Management contract for collection of waste at source, transportation, secondary storage and spreading it on landfill site. The contract awarded in 2003 is for a period of 10 years. The main feature of this project is that the entire investment in providing community bins, transport equipment, equipment for levelling of waste on the landfill site, manpower, etc. is that of the contractor. The Municipal Corporation is not required to make any capital investment, whatsoever.

Description of the initiative: Ulhasnagar Municipal Corporation chalked out a detailed action plan for the management of its solid waste. A detailed route map was also prepared for the movement of the vehicles.

The cost of Solid Waste Management was worked out and a suitable contractor was selected after calling bids from various interested parties. The scope of work under this contract includes door-to-door waste collection, storage and transportation. The contractor provides the entire infrastructure, viz., handcarts, community bins, transfer stations and vehicles along with the required manpower.

The Operation & Maintenance of existing infrastructure at landfill site, i.e., roads, lighting, water supply, sanitary facility, etc. and operation of vehicles and levelling of waste is also the responsibility of the contractor. The contract also places responsibility of generating public awareness for waste minimisation and segregation for entire city on to the contractor.

As per the contract, minimum of two bins for collection of dry and wet waste are to be provided at community level. The contractor has provided an additional bin for collection of debris. Covered bins are provided at the planned locations according to the area and the amount of waste generation. In case of bulk generators, like hotels, institutions, shopping malls, small-scale industries, etc., the bins are provided for which a charge is levied.

A six-month period was allowed for planning of operations, procurement of vehicles, equipments or accessories and their commissioning.

As per the contract, the Contractor has to provide as well as pay for workers. It is binding on Contractor to provide necessary facilities to workers as per the Contract Labour Act, 1970. Contractor also has to ensure payment as per Minimum Wages Act. The contractor cannot employ staff under 18 years of age. Workers must be given identity cards, as

well as two sets of uniforms, gloves, masks, boots, raincoats etc. The contractor also must carry out mandatory annual medical check up for all workers. The contractor has to keep the Corporation indemnified in respect of all claims and has to insure all workers as well as equipments.

The contractor can take services of any employees of the Corporation on payment in advance of an amount equal to the three months' salary of such employees. The contractor has also to pay the allowances, gratuity contribution, pensions and provident funds, dependent allowances as per Government rules.

The Corporation is to provide space for parking vehicles, keeping bins and carts and office space in each of the four administrative wards free of cost. Contractor is to provide fencing and other infrastructure at these sites.

The work is carried out in two shifts and a third shift is allowed in exceptional cases.

The existing staff of the Municipal Corporation is deployed for sweeping roads, open drains, public toilets all over city.

Performance monitoring: The performance measurement is carried out ward-wise through joint inspections. The work satisfaction level is decided after daily joint inspection and the performance is recorded as weightage based against each item. During the inspection, an opportunity is given to rectify the defects and improve weightages up to 100 percent.

Payment mode: The Corporation has to pay to the contractor based on the weight of waste transported to the landfill site. The payment is made at the end of every 15 days of work.

Deductions are made depending upon the quality of work. Giving marks out of 1000 for various parameters is used for daily assessment of the contractor's work. The payment is proportionately reduced based on percentage weightage computed. The contractor is given a chance to rectify the defects, which may be noticed. (Net payments per day = Total quoted Rs. per day x points obtained).

The escalation is applicable after one year of the commencement of the work and is at the flat rate of five percent per annum on the rates of the preceding year.

The average performance of the contractor has been 90 percent. Maximum payment made till now is based on 98 percent performance.

Results:
The Corporation could achieve cleanliness without investing in the capital cost.
Involvement of private operator has helped in solving the problem of lack of sufficient Municipal staff and lack of resources to employ new staff for Solid Waste Management activities.
The capital investment and the deployment of staff for operation and maintenance can completely be borne by the contractor.
Ulhasnagar is one of the few cities that have made provisions to segregate the waste at city level in a comprehensive manner from door-to-door collection to landfill site. The Municipal Corporation is in the process of developing a composting site at the city level.
The monitoring and evaluation criteria included in the action plan for Solid Waste Management of Corporation helps in keeping check on the work of the private operator.
Involvement of private contractors can allow local bodies to provide full compliance of the Solid Waste. They are willing to invest in the necessary tools, equipments, etc. It is also found that such machinery is maintained more efficiently by the Private Sector. The local body does not invest its finances and is liable to pay only a part of the operating cost. Role of the Corporation as a facilitator is sustainable for a much longer period and the local body can concentrate on other day-to-day activities.
This also can generate substantial employment in urban areas. Such employment would be much more since financial resources available with it do not limit the extent of services provided by the local body.

Source: Documentation of Best Practices; The Ministry of Urban Development, Government of India.

Case Study 7: Door to door collection of Municipal Solid Waste in Nashik

Nashik Municipal Corporation has attempted to turn the city into a bin-less city. The initiative started in August 2003 and by now, the Municipal Corporation has successfully removed almost 90 percent of the community bins from the city. This has been possible as a result of the waste being collected from the residential areas at a pre-informed time, which is then directly taken to the compost plant.

Description of the Initiative: Nashik Municipal Corporation has contracted out the work of collection and transportation of the waste of the entire city to a single private agency. The contractor provides the vehicles and the labour. The primary responsibility of the contractor is to carry out door-to-door collection of waste from each household in the city by deploying his own vehicles. The vehicles operate from 9 am in the morning till 3 pm in the afternoon on the routes fixed by the Municipal Corporation. The contractor also lifts the uncollected garbage on its route. The waste collected by the contractor should not contain any stones/soil and garden waste.

The vehicles have to be such that the waste does not fall on the road and the contractor is supposed to transport the collected waste in covered vehicles. In case of any breakdown, the contractor has to replace the vehicles within one hour failing which a fine equivalent to the daily payment due to the contractor is levied. The vehicles empty the waste at the processing facility in presence of the Municipal staff and the weight is jointly recorded.

The contractor also needs to organise the labourers and ensure that they are provided with the necessary safety equipments, like gumboots, gloves, etc. The contractor is free to employ as many workers as it deems fit and has to directly make payments to them. The contractor has indemnified the Municipal Corporation against any claim by the workers.

The Municipal Corporation pays a fixed charge of Rs. 475 per tonne for collection and transportation to the contractor. Payment is done after monitoring the work of the contractor. In case of default, certain penalty is levied from the payment. The contract is for a period of one year. This is renewed depending upon the performance of the contractor.

Benefits:

- Elimination of bins from the city has resulted in giving the city a clean look.
- The people have benefited, as they are getting the service at their doorstep. Their tendency of throwing waste on the streets has reduced considerably.
- The employment is generated at local level by involving Private Sector. Also, the Corporation does not have to bear the burden of the labour and transportation.
- The short-term of the contract helps to maintain the quality of work by the contractor in order to get his contract renewed.
- The contract is output based (tonne of waste reaching the processing site) and is, thus, very easy to monitor.

Sustainability:

The sustainability of the practice will depend upon the contribution of the local Corporators and the citizens in the long run. Educating the residents about segregation at source shall go a long way in sustaining the practice.

The practice is transferable to other cities of similar size, which are still trying pilot projects for door-to-door collection of waste.

Source: Documentation of Best Practices; The Ministry of Urban Development, Government of India

Case Study 8: Participatory approach in solid waste management and sanitation by Visakhapatnam Municipal Corporation

Visakhapatnam Municipal Corporation has implemented a comprehensive solution to the twin problems of solid waste management and sanitation. Through Resident Welfare Associations (RWAs), i.e., associations formed by citizens, VMC partnered with citizens in waste management exercises. Two programmes, '*Janachaitanya*' and '*Shubhram*', were initiated for the management of solid waste and cleaning of drains and roads, respectively. In both these programmes, citizens actively participated in project estimation, resource mobilisation, execution, monitoring, and contribution in terms of cash and supervision. The two programmes have jointly resulted in improving sanitary conditions in 900 localities covering about 75 percent of the population.

Intervention: Insufficient manpower in VMC from the year 1995 onwards had adversely impacted its service quality, thereby hampering waste management and cleanliness. Considering its insufficient manpower and the imminent health and environmental effects resulting from sub-standard waste management, the VMC decided to involve residents in the city's cleanliness drive.

The cleanliness drive started with the launch of *'Janachaitanya'*, an awareness programme focused on educating residents on environmental hygiene. The programme involved door-to-door garbage collection. The residents were involved in waste management measures by way of small cash contribution and labour.

The localities were encouraged to form welfare associations or *'Sanghams'* and they collectively contributed to a fund dedicated to the sanitation drive. The associations facilitated door-to-door garbage collection by employing rag pickers and providing them remuneration

from the fund.

The waste collected was, then, dumped at a central garbage location point, from where it was picked by Municipal Corporation vehicles for transportation to the Kapuluppada Dumping Yard.

Based on the success of the *'Janachaitanya'* programme, VMC undertook discussions with RWAs. As a result, the *'Shubhram'* programme was conceived. Under this programme, *Sanghams* and the Municipal Corporation joined hands to clean and manage drains and roads on a cost-sharing basis.

The residents and the public health wing of the corporation conducted a joint survey of the targeted locality to arrive at the number of workers to be engaged for the programme. The corporation and the *Sanghams* shared the financial burden of employees' salary and other implementation costs.

The local association manages the entire operation with the guidance and support of the corporation. However, the local association directly makes payments to the workers. At times, the residents, while on their morning walks, supervise the surrounding cleanliness levels. As a result of the high level of resident participation, there has been an increase in awareness and civic consciousness about good sanitation methods in the city.

There is a systematic division of responsibilities. VMC participates in the formation of RWAs and offers technical advice. VMC's responsibility also includes transportation of waste from the collection point to the main dumping yard. VMC contributes Rs. 1000 per worker towards wages, and Rs. 100 per worker for implements, per month. The local residents' association raises the remaining amount. Further, equipments, such as wheelbarrows used for collecting garbage from by-lanes of the localities, are provided by the Corporation. Constant monitoring is done jointly by the RWAs and VMC to ensure proper execution. The initial expenditure incurred by the residents and the Corporation was in the ratio 1:2; recurring costs are to be borne by the residents.

Outcome:

500 *Sanghams* in Visakhapatnam have adopted the *Janachaitanya* programme. In all the localities, rickshaws supplied by the Corporation are well maintained; the initiative has made a good impression on the general public. The *Shubhram* programme had been adopted by 400 societies in the city. Around 2000 workers are engaged in cleaning the premises and drains, and depositing dust and garbage at a specified place. The garbage is then picked up the Municipal authorities to be dumped at the landfill site.

The two programmes have led to an improvement in sanitary conditions in almost 900 localities, covering about 75 percent of the population. Involving residents in the hygienic sanitation drive has not only enabled a more prudent waste management programme, but has also resulted in efficient utilisation of human resources.

These initiatives have successfully achieved their target of creating trust, and establishing a communication channel between the partners. They also provide a strong foundation of partnership through which other joint initiatives can be carried out successfully.

Source: Documentation of Best Practices; The Ministry of Urban Development, Government of India

Fund based accounting system (FBAS) for better financial management of ULBs: FBAS can assist ULBs in better financial reporting, management and tracking. An example of implementation of FBAS through PPP is described in the following case study.

Case Study 9: Fund Based Accounting System in Bangalore Mahanagara Palike (BMP)

Situation before the initiative: BMP, like any other urban Local Body in India, had been traditionally following the cash based Governmental system of accounting. This implies that accounts were maintained on single entry, cash basis and accounting controls were limited to budgetary comparisons and bank balancing. The annual accounts prepared reflected only the cash flow, i.e., money actually received and spent during a financial year without taking into account accrued income and outstanding liabilities pertaining to the year. In some cases, even segregation of capital and revenue transactions was not made resulting in the inability to draw up a balance sheet for the Corporation.

There was no computerisation in the Finance and Accounts Department. The manual system was labour intensive and inefficient. This affected tax collection and flow of accounting information. Procedures lacked standardisation and there was data redundancy.

Description of the initiative: One of the major initiatives undertaken by the BMP in the area of accounting and budgeting reforms is the Fund Based Accounting System (FBAS), which has been developed and funded by the BATF as a Public Private Partnership project in association with the BMP. The FBAS is a modern international accounting system that applies the 'enterprise approach' to local Government accounting. In this system, three fund types – Government, Proprietary and Fiduciary, organise the BMP accounts. This facilitates management by objectives for each fund and strengthens the financial planning capabilities of the accounting system.

The FBAS also tracks assets and liabilities as well as receivables and payables, thereby providing transition to accrual basis of accounting.

The implementation of FBAS was a huge task, which involved process mapping of the existing system; reengineering of information flows; computerisation of accounts of works; assets and payrolls; and asset verification and documentation.

The BMP Accounting Regulations were amended to include the adoption of GAAP rules and GASB 34 principles, which it follows. Under this initiative, complete financial information about each ward is available. This includes information on budget allocation, progress of development works, and status of revenue collection. The same information is available to public.

The modern Accounting system FBAS has been designed to serve as an internal vigilance system with a number of preventive features. For instance, the bank reconciliation of the revenue receipts along with the structured daily reporting system ensures that all the collections are accounted properly and remitted to the BMP bank accounts. The other payment modes, such as payments at citizen service centre, Bangalore One centre, Banks, credit cards etc. are also tracked without any time delay in order to ensure the resources being applied to developmental activities. On the other hand, all the civil works are assigned a unique work code, which makes the tracking of the application of resources easier and faster to prevent misappropriation or mismanagement.

Results achieved:

1. As an impact of fund based accounting system, the information flow cycle time in the BMP has come down from 48 days to 48 hours.
2. With the help of FBAS, the city Government has been able to publish its half yearly and yearly financial statements consistently from the year 2002–03.
3. It has facilitated proper financial reporting and analysis.
4. It presents a true picture of the financial position of BMP and helps in better financial management.

Source: Documentation of Best Practices; The Ministry of Urban Development, Government of India.

4.12 Hazardous Waste

'Polluters Pay's Principle – Supreme Court: A monitoring Committee on Hazardous Waste, set up by the Supreme Court, has looked into the allegation of pollution created by Coca Cola, which distributed its sludge to farmers at Plachimada, Palakkad, where the soft drink giant has a bottling unit. The Committee came to the conclusion that Coca Cola will have to take quick measures to ensure water supplies to all the people in the vicinity of the plant. In order to reduce the withdrawal of groundwater, both the units are directed to install reverse osmosis systems to ensure that the use of public water for effluent treatment is returned to its original condition for reuse. This recommendation has to be implemented within six months.

Source: State of Environment Report-India, 2009, page 110.

Disposal guidelines for household hazardous waste (HHW): The following guidelines can assist in safe disposal of household hazardous waste.

1. Most HHW may be disposed off either by discarding with solid waste or pouring it down the drain. Some items, however, may require preparatory steps by the consumer (e.g., drying and wrapping the product) prior to placing the product in the trash for collection.
2. To solidify materials, mix the waste with enough non-flammable absorbent material, such as clay, to absorb all free liquids. Place the solidified material in a bag or wrap in newspaper before disposal.
3. No liquids, automobile batteries or tires may be placed in a sanitary landfill.
4. Some products, in small quantities, may safely be disposed of through the home sewage and septic system. It is important to know which type of sewage system serves the home because this dictates, which products may be safely poured down the drain. For example, large city treatment plants may handle some types of HHW better than smaller treatment plants, whereas septic tanks may not be able to handle them at all.
5. Generally, the products such as may be flushed with lots of water down a sink or toilet, but not in septic tank systems such as never mix products containing bleach with those containing ammonia.
6. The following may be dried completely, and placed in the trash with the lids removed which are small amounts of latex paint, latex caulk, glaze, spackle, empty containers, putty, grout, cosmetics, and empty aerosol cans.
7. Chemicals should not be mixed together. Products should be poured slowly down the drain to avoid splashing and flushed with large volumes of water. Consumers should choose a drain, which has adequate

ventilation and is away from food preparation areas.

8. Products, such as antifreeze, should not be poured down septic tanks, outside drains, in the storm sewer, or on the ground. This can cause groundwater contamination and/or operational problems with the septic system or Publicly Owned Treatment Works (POTWs).
9. Recycle the empty container, if possible.
10. Alternatives to some household hazardous products can be purchased or made at home. Read the product label carefully to select an appropriate alternative or use caution when making an alternative at home.

Source: Chapter 1, Household Hazardous Waste, Best Management Practices Resource Guide, Georgia DOD Pollution Prevention Partnership Solid Waste & Recycling Work Team, Solid Waste & Recycling Resource Guide, November 2000.

Plasma Gasification technology for treatment of Hazardous waste into energy as well Treatment, Storage and Disposal Facility for hazardous waste: The World's Largest Plasma Gasification Facility Processing Hazardous Waste into energy has been demonstrated in Pune, India. A Treatment, Storage and Disposal Facility operator, M/s. Maharashtra Enviro Power Ltd. in Pune, is using the plasma gasification technology to recover energy from hazardous waste. This not only reduces the load on Trreatement, Storage and Disposal Facility (TSDF) it also prolongs its life. The technology uses two 72 tonnes-per-day hazardous waste to energy recovery plants in India. The operator is also building another 72 tonnes-per-day energy recovery from hazardous waste facility in Nagpur, India. This facility is likely to be completed by the end of 2010. Each plant will provide comprehensive disposal services for a wide variety of hazardous waste, and will produce up to 1.6 MW (net) of electricity.

Source: http://mpcb.gov.in; www.alternrg.com

Trace Metal Characterisation in Solid and Hazardous Waste Using Inductively Coupled Plasma – Optical Emission Spectrometer (ICP-OES): The detection of trace metals in environmental samples could be accomplished by various methods, such as colorimetric, polarographic, atomic absorption spectrophotometer, ICP technique, but trace metal analysis using ICP-OES is relatively simple, accurate, versatile and free from interferences and several trace metals can be analysed simultaneously in a sample. In order to assess the hazardous nature of Municipal and industrial solid wastes and the environmental impact caused by dumping of such waste, trace metals were detected by ICPOES. In Municipal solid waste and industrial solid waste, which are reported to contain various toxic and hazardous metals, such as Arsenic, Cadmium, Chromium, copper, iron, manganese, nickel, lead, selenium, antimony, cobalt, vanadium and zinc, etc., the samples of solid waste/hazardous wastes were analysed for various trace metal analysis.

Source: Annual Report of MoEF, 2010-2011, page 124-125.

Bio-Remediation of Contaminated Site in Ranipet Area, Tamil Nadu: More than two *lakh* tonnes of Hazardous Waste (HW) generated over a period of 20 years was dumped by M/s. Tamil Nadu Chromates and Chemicals Limited (TCCL) on an unsecured land area of 3.5 hectares within its premises located at Ranipet industrial area, Tamil Nadu. The leachate from the dump having Cr (VI) has contaminated the surrounding soil and water environment, with groundwater samples showing Cr (VI) concentration in the range of 50 to 200 mg/l. CPCB has sponsored a demo-project with the help of IIT Madras for field level bioremediation of Cr (VI) contaminated soil and aquifer in Ranipet area. The concentration of Cr (VI) has been observed to reduce from 2500 mg/kg to less than 200 mg/kg within 41 days. The results indicated that Cr (VI) reduction occurred in most of the wells surrounding the injection wells.

Source: Annual Report of MoEF, 2010-2011, page 125.

'Assessment of Persistent Organic Pollutant (POPs) Residues in Human Population of Delhi with Reference to Adverse Health Effects' Project: The POPs persist in the environment at very low levels and are linked to many health and environmental effects. The organo-chlorine pesticides are highly hazardous chemicals and

their widespread use makes them available in food chain and is absorbed by the human body through skin, inhalation, oral and placental routes. The above study was a collaborative project with University College of Medical Sciences (UCMS) Delhi to generate epidemiological data and establishment of relative risks/relationships between the incidence of adverse health outcomes including cancer due to exposure to pesticides with special reference to organo-chlorine Persistent Organic Pollutants residues and Polychlorinated Biphenyls (PCBs).
Source: Annual Report of MoEF, 2010-2011, page 127.

Disposal of Plastic waste through Plasma Pyrolysis Technology (PPT): Disposal of thin plastic bags, metalised plastics, such as *gutka* pouches, wafer packing, etc., multi-layer plastics, such as packaging materials, Poly Vinyl Chloride materials, i.e., Poly Vinyl Chloride tiles, pipes, etc. is a serious environmental concern all over the world. Incineration is the commonly used technology at present for the disposal of plastic and other organic waste material in developed countries. However, Plasma Pyrolysis is State of Art technology for the disposal of plastics and hazardous waste. CPCB associated itself with Facilitation Centre for Industrial Plasma Technologies (FCIPI), Institute for Plasma Research wherein an initiative to develop Plasma Pyrolysis Technology (PPT) with financial support from Department of Science and Technology (DST), New Delhi has been done.
Source: Annual Report of MoEF, 2010-2011, page 126.

Waste Management Road Map for the Management of Hazardous Waste; A draft road map for Hazardous Waste Management has been developed by the Central Pollution Control Board and the same has been forwarded to MoEF for consideration and publication. The road map emphasises the 3 R's principle, i.e., reduce, reuse and recycle and suggests various actions, such as creation of waste exchange bank, proposal for incentives to re-process with state of art facilities to meet CPCB guidelines and beyond, performance evaluation of Treatment, Storage and Disposal Facilities, online tracking system for movement of hazardous waste etc.
Source: Annual Report of MoEF, 2010-2011, page 133.

Co-incineration of High Calorific Value Hazardous Wastes: The problems of limited capacity of incinerators, secure land-fills, high disposal cost can be effectively addressed by co-processing of these wastes in cement kiln, iron and steel plants and power plants. When compared to conventional incineration, there is a triple benefit in co-processing in terms of energy recovery, saving of fuel and resource conservation. The high temperature alkaline media in Cement Kiln can effectively absorb a variety of chemicals/elements released from waste without affecting the quality of cement. Also, it gives better destruction efficiency than incinerator due to higher temperature and more retention time. CPCB has conducted 11 trial runs in year 2009-2010. The Ministry has approved the project on 'Trial runs for Co-processing of Hazardous Wastes and other wastes in Cement Plants, Power Plants, Iron and Steel industries' for a total cost of Rs. 5.04 *crores*.
Source: Annual Report of MoEF, 2010-2011, page 133.

Chapter 5: Proposed Actions for Different Sectors

5.0 Tourism, Art & Culture

Proposed actions to address sector specific issues and type of response has been identified and described in Table 25. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 25 clearly delineates these agencies.

Table 25: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Non-availability of safe drinking water/adequate infrastructure at tourist destinations, circuits & trekking routes.	Due to increased tourist traffic and inadequate infrastructure, the gap in the availability of safe drinking water has widened, which has led to the usage of untreated water.	Water born diseases & health risks	Prepare long term water supply Master Plan for tourist destinations & circuits.		√			Department of Tourism & Tourism Development Council	IPH, Department of Language, Art & Culture
			Prepare an inventory of drinking water supply sources for new trekking routes.				√	Forest Department	IPH, Department of Tourism , & Tourism Development Council
			Implement drinking water quality monitoring programme at tourist transit points, e.g., *dhabas*/restaurants for parameters like pH, Suspended Solids, Total Dissolved Solids, Bacteriological count. Develop appropriate regulatory mechanism for siting and management of *dhabas*	√		√		Department of Tourism, Tourism Development Council, IPH, ULBs, Rural Development, SADA, Food & Civil Supplies	IPH, PRIs, NGOs, CSOs
			Ensure information display, 'Safe Drinking Water', at the sources.			√		Department of Tourism & Tourism Development Council/Forests	IPH, PRIs, NGOs, CSOs
			Implement protection of water source programme at tourist transit points by isolating it from sewage, solid waste and animals.			√		IPH	PRIs, NGOs, CSOs, *dhaba* operators
			Preparation of Eco-friendly travel guidelines.				√	Department of Forests and Wildlife	Department of Tourism, Rural Development, PRIs, ULBs
2. Disruption of electricity supply at tourist destinations during tourist season	Increased electricity demand from the grid leading to power shortage and power outages. Increased demand	Impacts on account of new hydro power development	Prepare solar/biogas based decentralised electricity supply plan (off grid) for rural/community/tourist &/forest resorts.		√			Department of Tourism, Tourism Development Council & Forests	Himurja/DEST/ PRI/NGO/CSO Himurja

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	requires accelerated hydro power development.	to meet the demand							
			Promote solar energy programmes at tourist units/ hotels.			√		Department of Tourism, Tourism Development Council & Forests	Himurja
			Ensure mandatory compliance of National Energy Conservation Building Codes at new tourist resorts/hotels.			√		Department of Tourism / Tourism Development Council / Forests	ULBs, / Municipalities, / Department of Urban Development, Department of Energy
			Develop and promote niche area tourism by mainstreaming environment into development of new areas of Hill tourism, e.g., corporate/business/ medical/heritage tourism.			√		Department of Tourism, Tourism Development Council	Corporate Houses, Corporate Hospitals, Department of Health, Forests & Wildlife
3. Solid waste littering & improper disposal along trekking routes, tourist circuits & destinations, e.g. plastic waste, pet bottles, tetra-packs, packets of snack food, food items and batteries from cameras/audio/video equipments	Inadequate collection, treatment and disposal of solid waste at tourist units/destinations/ circuits leads to solid waste build up at these locations. Further, burning of non-biodegradable waste deteriorates air quality.	Air / Water / Land pollution and associated health risks due to biodegradable, non-biodegradable and hazardous waste disposal. Degraded aesthetics	Establish non-biodegradable waste (plastic waste/pet bottles, tetra packs, packets of snack food) collection & treatment infrastructure for tourist circuits in the State through PRIs.				√	Department of Tourism, Tourism Development Council, Forests, PRIs	Recyclers, NGOs, CSOs, PRIs, ULBs Department of Urban Development, Rural Development
			Promote decentralised composting of food waste at *dhabas* & tourist transit points/units/resorts.			√		Department of Tourism, Tourism Development Council, Forests	PRIs, NGOs, CSOs
			Expand the scope of non-biodegradable waste rules to cover dry battery cells/batteries from electronic items or develop rules based on extended producer responsibility.	√				DEST & Government of Himachal Pradesh	HPPCB, ULBs, NGOs &, Department of Urban Development
			Monitor & penalise illegal burning of non-biodegradable waste at tourist transit points.			√		HPPCB, Department Of Tourism, Tourism Development Council, Forests	DEST, ULBs, PRIs

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
4. Disturbance to ecology and critical habitats due to development of new tourist circuits, units & destinations.	Uncontrolled & unregulated tourism.	Loss of vegetation due to new trekking routes and diversion of land. Change in habitat	Undertake studies on the carrying capacity of the new tourist circuits/destinations.			√		Department of Forests & Wildlife, Department of Tourism	Department of Tourism, Tourism Development Council,
			Undertake studies on the carrying capacity for expansion of existing tourist circuits/destinations.			√		Department of Forests & Wildlife, Department of Tourism	Department of Tourism, Tourism Development Council
			Minimise diversion of forest land in area specific Tourism Master Plan.		√			Department of Tourism, Tourism Development Council	Forests, Urban Development Department, Department of Rural Development, PRIs
			Develop area specific Eco-tourism Master Plan.		√			Eco-tourism Society, Department of Forests	Department of Tourism, Tourism Development Council
5. Lack of carrying capacity studies/ assessments	Change in land use/aesthetics. Construction of tourist resorts/hotels/bed capacity and other tourist infrastructure requires additional land. This land may be created by hill cutting or diversion of forest land. Mass congregation of pilgrims and other visitors during religious fairs/events.	Biodiversity loss Soil Erosion	Undertake studies on the carrying capacity for the expansion of existing tourist circuits/destinations. Regulate and control land use change under long term area specific Tourism Master Plan.		√			Department of Tourism, Tourism Development Council, Forests	Town & Country Planning
			Identification and preservation of valley slopes with aesthetic view under area specific Tourism Master Plan.		√			Department of Tourism, Tourism Development council	Town & Country Planning, PRIs
			Develop and promote diversification of tourism activities, such as Rural *Haat* (markets) as part of rural tourism along the existing tourism circuits/destinations.				√ √		
			Develop and promote eco-friendly activities and appropriate guidelines, e.g., camping, trekking, cycling in existing and proposed tourist circuits/destinations.				√		

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Mainstream environment in development of guidelines on 'Homestays'/bread and breakfast schemes.				√		
6.Increased emissions due to increased traffic at tourist destinations/ circuits/-routes, heritage sites & religious places.	☐ Location specific traffic congestion ☐ Lack of parking space	☐ Outdoor air quality deterioration and associated health risks	☐ Develop destination specific transportation plan.		√			Department of Tourism, Tourism Development Council	Transportation Department, Urban Development, ASI, Department of Language, Art & Culture
			☐ Establish infrastructure, like parking space as per transportation plan.				√	Department of Tourism, Tourism Development Council	Transportation Department, Urban Development, ASI, Department of Language Art & Culture
			☐ Strengthen air quality monitoring programme at specific destination sites.			√		HPPCB/Tourism Development Council	DEST, Department of Tourism, Tourism Development Council, Transport Department
			☐ Introduce Environment service charge at entry points. ☐ Identify ecologically sensitive tourist destinations/circuits, e.g., Rohtang pass, Mani Mahesh, Sangla Valley, Mandi, Sacred Groves etc.	√				Office of Divisional Commissioner	Department of Forests & Wildlife, Department of Tourism, LADC SADA
			☐ Prohibit/penalise polluting vehicles to enter the buffer zone of archaeological/ heritage sites.			√		Transport Department	DEST, Department of Tourism, Tourism Development Council, Transport, Petrol Pump Association
			☐ Ensure operation of Bharat Stage - IV compliant vehicles.			√		Transport Department	DEST, Department of Tourism, Tourism Development

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
									Council, Transport, Petrol Pump Association
7.Inadequate sanitation at tourist units/destinations/ circuits, religious places, heritage sites, trekking & transportation routes.	☐ Unregulated sewage discharge and open defecation. ☐ Lack of infrastructure facilities, like latrines at transit points (*dhabas*) & soak pits. ☐ Lack of adequate capacity of existing sanitation infrastructure. ☐ Non existence of sanitation infrastructure at tourist destinations/units.	☐ Contamination of the water source/ health risks	☐ Prepare long term sanitation master plan for tourist destinations & circuits.		√			Department of tourism, Tourism Development Council,	IPH, ASI, Department of Languages, Art & Culture
			☐ Establish sewage infrastructure, like latrines at tourist transit points/religious places & heritage sites. Construct toilet tents on all treks; set up and use toilet tents at least 100m away from water bodies.			√		*Dhaba* Operators, Tourist site & Heritage / Tourist site operators	Department of Tourism, Tourism Development Council, PRIs
8.Inadequate monitoring of unregulated activities, encroachments at tourist/heritage/ pilgrimage sites/ *dhaba* operators, hawkers, pony owners/operators	☐ Land encroachment, e.g., space occupied for parking of buses/ vehicles. ☐ Buffer zone activities/ camping near water sources/water bodies/ lakes, kindling of fire at campsites, washing of vehicles near water sources. ☐ Illegal collection of	☐ Air & Water pollution/ Biodiversity loss, loss of items of heritage, poor aesthetics.	☐ Develop regulatory framework for *dhabas*, especially for maintaining hygienic and sanitary conditions. ☐ Penalise transporters/vehicle operators for encroachment of road. ☐ Introduce battery operated vehicles and alternate mode of travels in certain tourist circuits and destinations.	√		√		Traffic Police	Department of Tourism, Tourism Development Council, ASI, Department of Language, Art & Culture

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	species of flora & fauna in forest areas. Pilferage/loss of items of heritage value. Bathing in water bodies/lakes/rivers		Develop & implement environmental code of practice for trekking and campsites. Review of the existing orders/directives and develop appropriate guidelines for various Departments in relation to tourism related duties, e.g., Tourist Police, Home Guards for monitoring the activities. Development of Tourist Information Centres, Information Kiosks, displays focusing on the protection of environment and local art, culture and heritage at vantage locations, e.g., hotels/resorts/mid-ways, enroute tourist circuits/destinations, public transport system, mass communication tools.			√	√ √	Department of Forests & Wildlife Department of Environment Science & Technology Department of Tourism	Department of Tourism, Tourism Development Council, tour operators ASI, Department of Language Art & Culture, DEST. Concerned Departments Department of Information and Public Relations
			Increased surveillance of tourist activities.			√		Police	Department of Forests, Department of Language, Art & Culture, Department of Tourism, Hotel, Forest, Resort Association
9. Inadequate tourist infrastructure	Limited infrastructure, connectivity (train/road/air), power and water supply and disposal of liquid and solid waste. Limited hotels & other types of	Increased health risks, unhygienic and unsanitary conditions due to overcrowding.	Preparation of area specific Master Plan consisting of satellite destination mapping to decongest existing tourist destinations. Adopt/adapt and promote good practices for Hill Tourism. Develop infrastructure in tourist circuits/destinations keeping in mind the architecture of the hill		√			Department of Tourism, Tourism Development Council.	Department of Urban Development, Department of Rural Development, Town & Country Planning, NGOs, CSO,

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	accommodations.		region. □ Develop and promote appropriate rainwater harvesting structures suitable to the infrastructural facilities being developed. □ Develop and promote green ratings of resorts/ tourists units, which promote and demonstrate optimal energy use and other natural resource use and disposal (water, liquid and solid waste) in hill tourism.						Forests & Wildlife
10. Lack of awareness, training and capacity building on environmental issues related to tourism	□ Limited reach and extent of awareness campaign due to topography/hilly terrain. □ Lack of NGO/CSO participation	□ Unchanged consumer behavior leading to continuation of environment-unfriendly practices	□ Environmental awareness and capacity building programme on Solid Waste Management / Sanitation / Water for *dhaba* / transit point operators, trekkers & porters. □ Environmental awareness and capacity building programme for resort owners/Hotels Association. □ Environmental awareness programme for village communities involved in rural tourism. □ Environmental awareness programmes for tour operators/associations.			√		Department of Environment Science & Technology	Department of Tourism, Tourism Development Council, HPPCB, NGOs, CSO, IPH, Forests
11. Inadequate attention on the preservation of local art, architecture and culture.	□ Insufficient dissemination of knowledge and understanding of rich and varied local art, culture, heritage and architecture □ New buildings/ infrastructure are planned, designed and constructed without	□ Increase in new buildings/ Infrastructure, which do not conform to the laid down norms □ Rise in obtrusive buildings/	□ Planning and design of new buildings following the ridge approach and its strict compliance by all project proponents. □ Use of local materials and resources in the planning, design and construction of new buildings following the prevalent local art, architecture and culture,				√	Department of Language, Art and Culture	Town and Country Planning Department of Tourism LADA, SADA, Urban Local Bodies, PRIs, INTACH, Temple Trusts,

Issues	Causes	Impacts/ Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	adequately considering the local architecture, heritage and culture.	Infrastructure which do not blend with local surroundings. Risk of such places losing their heritage and potential loss of value of the destination as tourist circuits / destinations	which blends with the surroundings. Plan, design and construct new buildings/infrastructure, which blends with local art, architecture and culture. Depict murals and frescoes in the new buildings/infrastructure as per the prevalent local art, architecture and culture. Develop promotional materials on local art and architecture and set them as displays, e.g., murals/frescoes/wall scapings on the roadsides and pavements for aesthetic ambience in urban and rural settings. Develop and maintain green areas in and around the protected monuments and maintenance of sanitation for better aesthetics. Levy environment service charges to generate revenue and proceeds to be utilised for the maintenance of protected monuments. Maintenance of unprotected monuments by ULBs/PRIs						*Devasthan Samiti*/ Board, NGOs/CSOs

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 26. These monitoring requirements should be strictly followed for critically polluted and vulnerable areas along tourist circuits and destinations, and tourist/trekking routes.

Monitoring and Reporting of Tourism Master Plan: Monitoring of Tourism Master Plans should be carried out every year to report deviations and slippages.

Monitoring and Reporting of Number of Tourists: Monitoring of tourists per month and per day at tourism/ eco-tourism destinations and heritage sites should be carried out.

Monitoring and Reporting of Water Quality/Sanitation/Solid Waste: Collect the data both for surface and groundwater (district wise) and analyse the trends and level of contamination. This should be carried out at the source and other sources located at tourist transit points/*dhabas* and tourist destinations. This data should be processed, analysed and published quarterly. The water quality parameters should be tested as per IS 10,500. Monitoring of sanitation and solid waste at tourist transit points/*dhabas* and tourist destinations should be carried out and published quarterly.

Air Quality Monitoring and Reporting: Monthly monitoring of air quality in critically polluted urban tourist areas including heritage sites, tourist spots should be carried out as per national ambient air quality standards. All the monitored data has to be documented, reported and published by the relevant Departments on quarterly basis.

Monthly monitoring for tourist transit points/destinations has to be carried out for the following

- Tourist infrastructure as per the Tourism Master Plan.
- Cleaning of water source.
- Monitoring of water source supply.
- Sanitation infrastructure e.g., sewerage system, pit latrines, trash bins, compost pits.
- Culture and heritage sites defacement /encroachments.

All the above have to be documented and reported to the relevant Departments on quarterly basis. Also, the remedial measures taken to mitigate the situation have to be documented.

Environmental Impact Assessment (EIA) Studies of Tourist Circuits: Carry out EIA studies of tourist circuits, especially in highly vulnerable areas/eco-sensitive areas at five year intervals to assess the impact and its intensity.

Monitoring of Awareness Programmes to be Conducted: Annual tracking of awareness programmes/campaigns needs to be carried out. The areas include environmental aspects related to tourism, e.g., safe drinking water, littering at tourist destinations, open defecation, reducing, recycling. Conduct annual surveys to find the effectiveness of different campaigns and reformulate the communication strategy of the awareness programmes.

Creation of Common Platform/Forum for Inter-Departmental Coordination: Creation of common platform/forum for inter-departmental coordination and convergence of related Departments for monitoring and evaluation of suggested action plans is given in table 2. Common platform/forum should conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute the same to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update on Government of Himachal Pradesh website and other State

Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on tourism sector and environment in the State. This chapter will summarise the analysis of monitored data and performance of the sector based on following performance indicators.

Performance Indicators: For macro-level management of the drinking water, sewage/waste water, solid waste, air quality and infrastructure and regulated tourist traffic, issues identified, and gauging the performance of the above proposed actions, following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 26 will have to be monitored by a Coordinating Agency/Department.

Table 26: Performance Indicators

Outcomes	Indicators
1. Implementation of Tourism Master Plan/programmes/projects.	Reduced/increased number of tourist arrivals at tourist destinations/circuits. Reduced/increased number of de-licensing of tourist resorts/hotels/dhabas on account of contaminated water, sewage discharge and solid waste disposal. Reduced/increased number of *challans* issued to non-complaint vehicles either for pollution or parking or both at tourist destinations. Reduced/increased number of crimes related to archeological sites/theft of artifacts. Number of programmes/projects identified & implemented to address each issue.
2. Inter-sectoral coordination and integrated planning.	Creation of Inter-sectoral forums/ platforms. Regular meetings of such forums. New and effective enforcement mechanisms in force.
3. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers and staff of Tourism Department, hotel/resort association, transporter/taxi association, *dhabas*, PRIs. Creation of data bank at coordinating agency and regular publication on State Government website on the state of water, air, waste & tourism scenario & its implications.

5.1 Potable Water Supply

Proposed actions to address specific water issues and type of response have been identified and described in Table 27. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. It is required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 27 clearly delineates these agencies.

Table 27: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/ Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
Reduced water availability due to increasing demand (population & tourists)	Unreliable water supply. Increase in demand from population/tourists.	Deprivation of basic necessity and quality of life. Water riots. Health risk.	Promote rainwater harvesting programme both in rural & urban areas in the State.			√	√	IPH/RD	Department of Urban Development, ULBs, PRIs, CSOs.
			Develop a policy framework for allocating water & prices of allocated water.	√				Govt. of Himachal Pradesh	IPH, Health, Rural Development Departments, NGOs/CSOs, ULBs.
			Promote household drinking water storage, purification & prevention of microbial contamination programmes in urban/rural areas.			√	√	IPH	Rural Development Departments, PRIs, NGOs, CSOs, Health & Family Welfare Department, ULBs.
			Prepare & implement community/household level projects on water storage structures in rural areas				√	PRIs	IPH, Health, Rural Development Departments, NGOs/CSOs, ULBs.
			Monitoring of water borne diseases versus interventions at district level				√	Department of Environmental Science &Technology (DEST)	IPH, Health, PRIs, ULBs
			Introduce reuse of water from treated sewage to reduce water demand from non drinking usage.			√	√	Department of Urban Development	IPH, ULBs, PRIs, CSOs.
			Introduce dual system of plumbing to reuse grey water for flushing in buildings.			√		ULBs	Department of Urban Development, ULBs, PRIs, CSOs.
Reduced water availability due to source over-exploitation, source un-sustainability and neglect of traditional water source.	Limited water resources. Lack of river basin level planning. Competing water usage.	Drying up of source. Catchment Degradations. Waste of investment. Risk of food insecurity. Agriculture / Horticulture revenue loss.	Develop and implement source rejuvenation plans throughout the State.			√	√	IPH	PRIs/NGOs/CSOs, ULBs, Department of Agriculture, Department of Urban Development.
			Appointment of water regulator.	√				Government of Himachal Pradesh	IPH, CSO, NGOs, PRIs, DEST, ULBs, Department of Rural Development, Department of Urban Development, ULBs.
Reduced water	Unauthorised	Unaccounted	Accelerate/initiate strict actions			√		IPH/ULBs	Department of Urban

Issues/ Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
availability due to infrastructure constraints, e.g., non-availability of electricity supply & increased leakage in the public distribution system.	tapping/metering. □ Old/worn out infrastructure leading to leakage.	resource loss leading to strain on existing sources. □ Loss of revenue.	envisaged in the acts to stop unauthorised tapping of water.						Development, Municipality, NGOs/CSOs/PRIs.
			□ Develop district-wise programmes to reduce existing leakage significantly through strict compliance of laws & technical intervention & plugging.			√		IPH/ULBs	Infrastructure Developers, Operators, NGOs/CSOs/ Ministry of Urban Development, Power Utility.
			□ Encourage water sector reforms in water supply distribution, metering & revenue collection.			√	√	IPH/ULBs	Infrastructure Developers, Operators, NGOs/CSOs/Department of Urban Development.
			□ Ensure availability of uninterrupted electricity supply			√		HPSEB Ltd.	Power Division.
Reduced water availability due to lack of integrated water management strategies / plans, monitoring & funds for implementation.	□ Hydropower projects/other water uses require water diversion. □ Competing water use. □ Non-availability of adequate funds for planning & implementation.	□ Changes in hydrological regimes lead to variation in ecology of connected natural drainage systems as well as water uses down-stream. □ Ecological imbalance. □ Catchment degradation. □ Water pollution.	□ Develop & implement basin plan consisting of water balance based on water availability, water requirement (different sectors) & its allocation and discharge in coordination with other States & Central Government.			√	√	IPH, Water Management Board	Department of Urban Development, ULBs / NGOs / PRIs / CSOs, CWC, CGWB, Department of Forests, Department of Energy, DEST.
			□ Preparation and implementation of Catchment Area Treatment (CAT) plans.		√		√	Department of Forest and Wildlife	Department of Urban Development, ULBs/ NGOs/PRIs/CSOs, CWC, CGWB, Department of Forests, Department of Energy, DEST.
			□ Constitute a State level Steering Committee to implement all the plans in an integrated manner.			√	√	IPH, Water Management Board.	All line Departments

Issues/ Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Monitor the basin, CAT and wetland management plans by concerned responsible agencies.			√	√	By concerned agencies	Department of Forests, Department of Agriculture, Department of Minerals, Department of Fisheries, State Energy Utilities, DEST, Department of Tourism ULBs, IPH, HPPCB
Deterioration of surface & groundwater quality due to contamination.	☐ Water pollution due to fertiliser, pesticides, sewage & dung ingress in water sources. ☐ Poor management of waste water contamination due to wrong siting of waste disposal sites, e.g., location of waste disposal site below the HFL in the river basin.	☐ Increased public health risk & burden of diseases.	☐ Accelerate/Initiate action for implementation of IEC programme under each health scheme/ programmes being implemented at State level.			√		HPPCB/IPH/RD	DEST/ULBs, PRIs/ CSOs, HPPCB, Health & Family Welfare Department
			☐ Design & Initiate awareness development programmes / projects with NGOs/CSOs.			√		Health & Family Welfare Department	CSOs/NGOs
			☐ Allocation of waste disposal site or dumping site above HFL in the river basin. Further, the site should follow criteria prescribed by the Central Pollution Control Board.			√		ULBs	Department of Forests, Department of Agriculture, Department of Minerals, Department of Fisheries, State Energy Utilities, DEST, Department of Tourism, IPH , HPPCB
Inadequate sewage infrastructure & sanitation services in the State.	☐ Drinking water source / transmission & distribution. ☐ Contamination due to inadequate sewage & solid waste treatment and disposal.	☐ Increased public health risk/mortality & burden of water borne diseases ☐ Water related diseases due to unsafe drinking water on account of inadequate sanitation.	☐ Accelerate/initiate actions for drugs distribution envisaged in project implementation plan of NRHM for the State.				√	Health & Family Welfare Department	Rural Development Department/PRIs/ NGOs/CSOs
			☐ Accelerate/initiate actions for health infrastructure development & project implementation plan for sanitation under NRHM.				√	Health & Family Welfare Department	Rural Development Department/PRIs/ NGOs /CSOs, DEST
			☐ Accelerate/implement/plans/projects for biomedical waste management in rural/urban areas.			√	√	Health & Family Welfare Department	Rural Development Department/PRIs/ NGOs/CSOs, DEST, IPH
			☐ Accelerate/implement plans/projects for Municipal Solid Waste disposal in rural/urban areas.			√	√	ULBs/PRIs	Rural Development Department/PRIs/ NGOs/CSOs, DEST, IPH, Health and Family Welfare Department
			☐ Accelerate and implement plans/projects for sewage collection, treatment & recycling.			√	√	UD/RD	Department of Urban Development, PRIs/ CSOs / NGOs
Inadequate	☐ Inadequate	☐ Resource	☐ Accelerate/implement actions /			√	√	PRIs	IPH, Rural Development

Issues/ Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
community participation in rural water supply & sanitation leads to poor water management..	ownership of the resource.	loss/wastage. □ Increased Government expenditure for management of resources. □ Increases drudgery of women for fetching water in remote areas in the State.	projects under sanitation plans of PRIs at village level. □ Develop & implement gender empowerment & women participation in rural sanitation projects, e.g., water conservation project.			√		PRIs	Departments/Health & Family Welfare Department IPH, Rural Development Departments/Health & Family Welfare Department
Gaps in coordination of institutions managing water sector leads to water management which leads to gap in operational efficiency & financial realisation.	□ Lack of implementation of reforms. □ Lack of pricing of resource. □ Continued subsidies on resource. □ Resource under valuation. □ Absence of decentralised operation & maintenance of water supply schemes.	□ Resources loss/wastage □ Revenue loss to the sector.	□ Accelerate time bound reforms/programmes/projects leading to increased efficiency. □ Carry out viability studies for different economic instruments. 'Payment for Environmental Services/ Polluter Pays' in water sector in the State.	√ √		√ √	√ √	IPH, Department of Environment Science & Technology	ULBs, Rural and Development Departments / PRIs / NGOs / CSOs, IPH, ULBs, Industry, Consultants, Directorate of Factories, Departments of Health & Family Welfare, IPH

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 28. These monitoring requirements should be strictly followed for water supply sector.

Monitoring and Reporting of Pre and Post Monsoon Water Spread Area and Water Levels of Water bodies / Ponds / Reservoirs / Wetlands: It would also include monitoring and reporting of seasonal (pre and post monsoon) species variation, biomass production and actual silt load. This data should be processed, analysed and published at least twice in a year (pre and post monsoon seasons).

Monitoring of implementation of Catchment Area Treatment (CAT) Plans: It would also include documenting, reporting and publishing the same on an annual basis using remote sensing and Geographical Information System applications.

Monitoring of Implementation of Wetland Management Plans:
Documenting, reporting and publishing the same on an annual basis.

Monitoring and Reporting of Water Harvesting Programmes: It should be carried out for trend analysis of critical areas for groundwater recharge. This data should be documented, reported and published annually.

Seasonal and Annual Monitoring and Reporting of Flow from Small Hydro Projects: Seasonal and annual monitoring and reporting of release of water from dams/reservoirs in command and down-stream areas should be carried out. Monitor and report water regime or hydrology of the system, water levels at various points, inflows, retention and outflows. This data should be documented and recorded seasonally along with climate data. It should be documented, reported and published annually.

Water Quality Monitoring and Reporting: Collect the data both for surface and groundwater (district wise) and analyse the trends and levels of contamination. This should be carried out at the source and at household levels. This data should be processed, analysed and published quarterly. The water quality parameters should be tested as per IS 10,500.

Monitoring and Reporting of Disease Occurrence: Monthly monitoring of occurrence of water and air borne diseases should be carried out. Hospitalisation and mortality data should be recorded every month. The monitoring report has to be documented and reported quarterly by the coordinating Department.

Monthly Monitoring has to be Carried Out for the Following:

- Health infrastructure.
- Cleaning of storage tanks and water source.
- Checking of supply of water source.
- Biomedical waste collection, treatment and disposal.
- Solid Waste Mangement collection, treatment and disposal.
- Regular inspection of leaks in the pipelines.
- Regular checking of water meters at household level.
- Regular checking of water treatment plants and its operation.

Monitoring of Awareness Campaign: Annual tracking of awareness programmes / campaigns needs to be carried out. The areas include industrial effluents, degradation of fish species, degradation of water quality, use of pesticides, depletion of wetlands / water bodies/reservoirs, flora and fauna, unrestricted dumping of sewage solid waste and toxic chemicals, deforestation, conservation techniques, old and traditional methods of irrigation. Conduct annual surveys to find the effectiveness of different

campaigns and reformulate the communication strategy of the awareness programmes.

Creation of Common Platform for Inter-Departmental Coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meetings via different media.

Daily update of State Government's website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on health sector and environment in the State. This chapter will summarise the analysis of monitored data and performance of the sector based on following performance indicators.

Performance Indicators: For macro-level management of water related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators, as outlined in Table 28, will have to be monitored and reported by the concerned coordinating Agency / Department.

All the above have to be documented and reported to the relevant Departments on quarterly basis. Also, the remedial measures taken to combat the situation have to be documented.

Table 28: Performance Indicators

Outcomes	Indicators
1. Improvement of water quality/quantity.	Meeting at least designated Best Use Class D for surface waters as given by Central Pollution Control Board. Per capita availability.
2. Desiltation for removal of organic/toxic sediments.	Percentage reduction in volume of silt disposal.
3. Catchment treatment to check erosion.	Number of CAT plans approved & implemented. Percentage of area treated under CAT plan each year.
4. Rain Water Harvesting.	Number of rain water harvesting plans approved and implemented. Groundwater level rise & fall in the catchment areas.
5. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media Number of trainings imparted to officers & staff of lines and associated Departments. Creation of data bank at coordinating agency & regular publications on State Government websites.
6. Implementation of health improvement programmes/projects.	Reduced/increased percentage of occurrence of water borne diseases. Number of programmes/projects identified & implemented to address each issue.
7. Treatment of sewage/Municipal Solid Waste / Bio Medical Waste.	Percentage of sewage generated versus treated. Percentage of Municipal Solid Waste generated versus treated. Percentage of Bio Medical Waste generated versus treated.
8. Degree of local participation in wetland management.	Number of wetland management committees formed. Number/Gender in wetland management committee. Number of issues raised & documented in the wetland management committee.

Outcomes	Indicators
9. Scientific management of wetlands.	Number of wetlands proposed for wetland management plan development & implementation. Number of wetland management plans approved versus proposed.
10. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New and effective enforcement mechanisms in force.

5.2 Sewage

Proposed actions to address specific water issues and type of response have been identified and described in Table 29. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. It is required to focus and channelise their course of work in order to have an integrated planning. For this inter-sectoral coordination in planning, execution and monitoring is required. It is important that planning and execution of any type of response requires identification of coordinating agency and collaborating agency. Table 29 clearly delineates these agencies.

Table 29: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Increasing gap in sewage collection, treatment & disposal is leading to water pollution.	☐ Increased sewage generation from population/tourist. ☐ Inadequate infrastructure due to incomplete connectivity & coverage & absence of Sewage Treatment Plants (STPs).	☐ Increased water pollution. ☐ Increased burden of diseases/ health risks.	☐ Prepare and implement long term Master Plans for urban/rural areas including tourist destinations. The master plan should include strict siting of STPs as per Town & Country Planning acts/guidelines.			√	√	Department of Urban Development/Department of Rural Development	TCPO, IPH PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Tourism
			☐ Implement Sanitation Master Plan. The implementation should include optimum operation & maintenance of the system including separate energy metering for STPs. The skill level of personnel in the line Departments should be upgraded to meet project requirements.				√	Department of Urban Development/Department of Rural Development	TCPO, IPH, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Tourism
			☐ Monitor the execution / implementation of Sanitation Master Plans & community sanitation projects.			√	√	Department of Urban Development/Department of Rural Development	IPH, HPPCB, ULBs, PRIs, CSOs, DEST, Department of Health & Family Welfare
2. Increased public health risks due to discharge & disposal of untreated sewage on land & water bodies.	☐ Water pollution due to sewage and dung ingress in water sources. ☐ Unhygienic methods of handling waste. ☐ Poor management of waste.	☐ Increased burden of diseases.	☐ Prepare sewage interception, diversion & treatment plans for catchment areas of recipient water bodies.			√	√	Department of Urban Development/Department of Rural Development	IPH, Department of Forest, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Tourism

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Extensive water quality monitoring of surface and groundwater bodies & complete disclosure of monitoring results.			√	√	Himachal Pradesh Pollution Control Board	IPH, Department of Health, Department of Urban Development, Department of Rural Development & ULB
			☐ Ensure publication of monitoring results including trend analysis & follow up actions.				√	UD/HPPCB	IPH, Health, PRIs, ULBs
3. Increased public health risks due to open defecation in rural/urban areas & inadequate sanitation at tourist units / destinations / transit points & transportation routes.	☐ Inadequate sanitation infrastructure (rural & urban). ☐ Unregulated tourist transit points. ☐ Drinking water source / transmission & distribution coming in contact with sewage, Municipal & Bio-Medical Wastes.	☐ Increased burden of diseases/ mortality.	☐ Prepare & implement community/household level projects on sanitation in rural areas/urban slums.				√	PRIs	IPH, Health, Rural Development Departments, NGOs/CSOs, PRIs
			☐ Develop & implement sanitation plans for *mela* ground transit points, trekking routes, tourist destinations as part of Tourism Master Plan.			√	√	Department of Urban Development / Department of Rural Development	IPH, Infrastructure Developers, Operators, NGOs/CSOs/ ULBs, Department of Tourism.
4. Inadequate integration of water resource/water supply/sewage/ sanitation approach leads to higher water consumption and sewage generation.	☐ Competing water use. ☐ Inadequate demand side management. ☐ Inadequate monitoring of consumption. ☐ Independent institutional responsibility for consumption.	☐ Change in hydrological regimes leads to ecological imbalance. ☐ Resource loss. ☐ Catchment degradation/ sewage generation.	☐ Ensure adequate water availability for implementation of sewerage schemes in urban areas & low cost sanitation in rural areas/urban slums.			√	√	PRIs	IPH, ULBs/ NGOs/PRIs/ CSOs, CWC, CGWB, DEST.

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
		] Water pollution	Promotion of appropriate technology for recycling and treatment, e.g., decentralised treatment, common septic tanks, soak pits, manuring as per CEPHHO guidelines/manual.		√		√	PRIs	IPH, ULBs/ NGOs/PRIs/ CSOs, CWC, CGWB, DEST
5. Inadequate finances to accelerate / upgrade / implement water supply & sewage infrastructure results in water pollution.	Inadequate pricing of resources. Continued subsidy. Resource under valuation. Government expenditure.	Water pollution due to inadequate infrastructure.	Implement reforms for water supply distribution, metering and revenue collection, sewage collection, treatment & disposal, sanitation.			√	√	IPH/ Department of Urban Development.	Infrastructure Developers, Operators, NGOs / CSOs / ULBs.
			Carry out viability studies for different economic instruments, e.g., environmental services charge. 'Polluter Pays' principle in water & sewage sector in the State & implement the solution.	√		√	√	Department of Urban Development/ Department of Rural Development.	Consultants, Directorate of Factories, Departments of Health & Family Welfare.
			3. Develop and implement IT solution, e.g., online billing & payment.				√	Department of Urban Development/ Department of Rural Development.	DEST, IPH, ULBs, IPH.
6. Gap in institutional operational mechanisms related to sanitation leads to gap in operational efficiency.	Inadequate implementation of existing regulation & reforms. Inadequate integrated planning & coordination.	Gaps in service delivery. Increased water pollution.	Constitute a State level coordination committee to prioritise & implement integrated water resources /water supply/sanitation plans, programmes and projects.		√	√	√	IPH/UD/RD	Department of health & family welfare, ULBs

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Monitoring the progress of prioritised plans, programmes & projects quarterly.		√	√	√	Department of Environmental Science &Technology (DEST)	IPH/Department of Urban Development, Department of Rural Development, Department of Health & Family Welfare, ULBs.
7. Tardy implementation of reforms/lack of public participation in water supply & sewage sector leading to reduced coverage of sanitation services.	☐ Lack of implementation of reforms. ☐ Lack of business model.	☐ Reduced infrastructure development. ☐ Gaps in service delivery. ☐ Increased waste pollution.	☐ Accelerate & implement time bound reforms / programmes / projects leading to Private Sector & NGO participation in the sector.			√	√	UD/RD/IPH	PRIs/NGOs/ CSOs, IPH, ULBs
			☐ Accelerate / implement actions / projects under sanitation plans of PRI at village level.			√	√	Department of Rural Development	IPH, PRIs, Rural Development Department/ Health & Family Welfare Department
			☐ Develop and implement gender empowerment & participation under rural sanitation projects.			√		Department of Rural Development	IPH, PRIs, Health & Family Welfare Department
8. Inadequate awareness leads to lack of community participation in sanitation sector.	☐ Lack of ownership of the resource. ☐ Difficult terrain & desperate location. ☐ Lack of gender participation. ☐ Lack of NGOs participation.	☐ Unhygienic living condition/ burden of disease. ☐ Increased Government expenditure for management of sanitation. ☐ Water pollution.	☐ Accelerate/Initiate action for implementation of IEC programmes under each health scheme/ programmes being implemented at the State level.			√		UD/RD	DEST/ULBs/ PRIs/ CSOs, HPPCB, Health & Family Welfare Department
			☐ Design & Initiate awareness development programmes / projects with NGOs/CSOs.			√		UD/RD	PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Tourism, IPH.

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 30. These monitoring requirements should be strictly followed by the sewage and sanitation sector.

Monitoring and reporting of pre and post monsoon water spread area and water levels of water bodies / ponds / reservoirs / wetlands: It would also include monitoring and reporting of seasonal (pre and post monsoon) variations. This data should be processed, analysed and published at least twice in a year (pre and post monsoon season).

Monitoring of the Implementation of Catchment Area Treatment (CAT) Plans: It would also include documenting, reporting and publishing the same on an annual basis using remote sensing and Geographical Information System applications.

Monitoring of implementation of wetland management plans:
Documenting, reporting and publishing the same on an annual basis.

Monitoring of the Implementation of Rural/Urban Sanitation Plans/Projects should be carried out quarterly: This data should be documented, reported and published quarterly.

Water Quality Monitoring and Reporting: Collect the data both for surface and groundwater (district-wise) and analyse the trends and levels of contamination. This should be carried at the sources and at household levels. This data should be processed, analysed and published quarterly. The water quality parameters should be tested as per IS 10,500.

Monitoring and Reporting of Disease Occurrence: Monthly monitoring of occurrence of water borne diseases should be carried out. Hospitalisation and mortality data should be recorded every month. The monitoring report has to be documented and reported quarterly by the coordinating Department.

Monthly monitoring has to be carried out for the following:

- Health infrastructure.
- Cleaning of storage tanks and water source.
- Checking of water source supply.
- Sanitation infrastructure e.g., pit latrines, trash bins, compost pits.
- Regular inspections of leaks in the pipelines.
- Regular checking of water meters at household levels.
- Regular checking of sewage treatment plant structures, its operation and maintenance.

Monitoring of Awareness Campaign: Annual tracking of awareness programmes / campaigns needs to be carried out. The areas include industrial effluents, degradation of water quality, use of pesticides, unrestricted dumping of sewage solid waste and toxic chemicals, old and traditional methods of disinfection. Conduct annual surveys to find the effectiveness of different campaigns and reformulate the communication strategy of the awareness programmes.

Creation of common platform for inter-departmental coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update of State Government's website and other State Department's websites should be carried out. An annual

State of Environment Report can be published, which will contain a Chapter on sanitation sector in the State. This Chapter will summarise the analysis of monitored data and performance of the sector based on following performance indicators.

Performance Indicators: For macro-level management of sewage/sanitation related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcomes of these guidelines. These indicators, as outlined in Table 30, will have to be monitored and reported by the concerned coordinating agency / Department.

Table 30: Performance Indicators

Outcomes	Indicators
1. Improvement of water quality.	Meeting at least designated Best Use Class D for surface waters as given by Central Pollution Control Board. Meeting at least drinking water quality criteria for ground water.
2. Implementation of health improvement programmes/projects.	Reduced/increased percentage of occurrence of water borne diseases. Number of programmes/projects identified & implemented to address each issue.
3. Treatment of sewage/ Municipal Solid Waste / Bio Medical Waste.	Percentage of sewage generated versus treated.
4. Scientific management of sanitation.	Number of sanitation management plan development & implementation. Number of sanitation management plan approved versus proposed.
5. Degree of local participation in sewage/sanitation management.	Number of sanitation management committees formed. Number/Gender in wetland management committee. Number of issues raised and addressed.
6. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media Number of trainings imparted to officers and staff of line & associated Departments. Creation of data bank at coordinating agency & regular publications on State Government websites.
7. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/ platforms. Regular meetings of such forums. New and effective enforcement mechanisms in force.

5.3 Health

Proposed actions to address specific health issues and type of response have been identified and described in Table 31. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 31 clearly delineates these agencies. The following points should be mandatory for the Departments:

1. Strict monitoring at the time of training to maintain quality. For that, some benchmark independent assessment of teaching faculty will add to better capacity building and, ultimately, better product in terms of efficiency and creativity.
2. Teaching faculty need to be monitored in terms of national, international standards of research, experience and capabilities in terms of output in the field of excellence.
3. A system of examination may be introduced to assess the skill before promotion to the next higher ranks, thereby excluding the personal bias, prejudice and affections, to promote excellence and skills in the long run.
4. There must be some performance indicators at multiple levels.

Table 31: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordination Agencies	Collaborating Agencies
1. Water related diseases due to inaccessibility to safe drinking water.	☐ Untreated water supply source. ☐ Microbiological contamination from human/animal excreta, etc. ☐ Chemical contamination from agriculture / pesticides. ☐ Lack of dependable water source. ☐ Lack of storage infrastructure.	☐ Health risks / epidemics / diarrhoea/water related diseases ☐ Health risks / unhygienic living conditions.	☐ Promote household drinking water storage, purification and prevention of microbial contamination programme in urban/rural areas.			√	√	Health & Family Welfare Department.	TCP IPH Rural Development Department, PRIs, CSOs.
			☐ Prepare & implement community/household level 'water supply source protection projects' in rural areas.				√	PRIs	Health, Rural Development Departments, CSOs Department of Agriculture Department of Forests.
			☐ Prepare & implement community / household level projects on water storage structures in rural areas.				√	PRIs	Health, Rural Development Department, NGOs/CSOs.
			☐ Monitoring of water borne diseases by setting up water testing labs at district level.				√	IPH,	DEST, Health, PRIs, ULBs.
			☐ Increase monitoring (frequency & location) of drinking water quality in rural, urban areas at source & household levels. These part parameters could be pH, total dissolved solids, suspended solids, biological oxygen demand/dissolved oxygen, bacteriological count Maximum Probable Number Method.			√		IPH	DEST, PCB, ULBs/PRIs/ CSOs, Health & Family Welfare Department.
			☐ Promote safe and potable drinking water by way of installing RO/UV based water treatment system in schools.				√	Department of Education.	Department of Planning.
2. Health issues due to inadequate sanitation	☐ Lack of infrastructure. ☐ Lack of latrines. ☐ Inadequate sewage	☐ Health risks/unhygienic living	☐ Accelerate/initiate actions envisaged in project implementation plan for				√	PRIs	Department of Health & Family Welfare, TCP, Department of Education,

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordination Agencies	Collaborating Agencies
	collection, treatment & disposal.	conditions/water borne diseases.	sanitation.						NGOs/CSOs
			☐ Monitor progress of National Rural Health Mission(NRHM) programme performance.				√	PRIs	Health & Family Welfare Department, Department of Education Department of Environment, Science & Technology / NGOs / CSOs
			☐ Monitor occurrence of water borne diseases versus intervention, e.g., functional latrines in households/communities in rural areas & urban slums in each district.			√		Department of Environment, Science &Technology	Health & Family Welfare Department/NGOs/CSOs/ULBs/PRIs, MCs ULBs HIMUDA
			☐ Ensure adequate water supply & provide proper sewerage system by connecting each household with sewerage system.					IPH	
3. Health issues due to inadequate solid waste collection & treatment.	☐ Inadequate infrastructure for Municipal Solid Waste collection, treatment & disposal ☐ Inadequate infrastructure for Bio-Medical Waste collection, treatment & disposal	☐ Health risks / unhygienic living conditions/water borne diseases	☐ Accelerate / initiate actions envisaged in project implementation plan for Bio-Medical Waste management under NRHM.				√	Urban Local Bodies	Health & Family Welfare Department, TCP, Infrastructure Developers / Operators / NGOs /CSOs / PRIs
			☐ Accelerate/initiate actions for bio-medical waste management by setting up incinerators at district level, industrial areas and also in ULBs, which receive high number of tourists in view of promotion of health tourism in the State.				√	Health & Family Welfare Department &PRIs	Infrastructure Developers/Operators/NGOs/CSOs/ULBs Department of Tourism
			☐ Monitor occurrence of infectious diseases in rural/urban areas versus intervention, e.g., Municipal Solid Waste / Bio – Medical Waste in each district.			√	√	Department of Environment, Science &Technology	Health & Family Welfare Department / NGOs, ULBs, PRIs
4. Personal	Population behavior with	☐ Health risks /	☐ Awareness generation for					PRIs	Health & Family Welfare Department,

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordination Agencies	Collaborating Agencies
hygiene & sanitation.	respect to: Open defecation. Lack ofhabit of hand washing. Lack of kitchen cleanliness. Lack of bathing. Lack of latrine use.	unhygienic living conditions / water borne diseases.	promoting personal hygiene & safe sanitation practices in urban & rural areas.				√	&Education	NGOs/CSOs/ULBs
			Strengthening of existing awareness campaigns for propagating personal hygiene & safe sanitation practices in rural/urban areas.			√		PRIs &Education	Health & Family Welfare Department, NGOs/CSOs
			Strengthen awareness campaigns on health & environment theme & monitor the performance of awareness campaigns.			√		Department of Environment, Science &Technology	Health , NGOs PRIs CSOs/CBOs HP- SC/ST Schools
5. Health deterioration due to air pollution	Exposure to smoke due to burning of wood as domestic fuel. Air pollution due to increased vehicular traffic. Air pollution due to emissions from industries especially in Solan and Sirmaur.	Health risks / increase in respiratory diseases.	Awareness generation to promote awareness about health impacts of fuel wood/biomass usage as domestic fuel.			√	√	Himachal Pradesh Pollution Control Board (HPPCB)	Health & Family Welfare Department, TCP, NGOs/CSOs
			Promote alternate domestic safe/cleaner fuel to reduce dependence on fuel wood in urban areas.			√		Himurja	ULBs
			Promote solar energy applications for domestic usage in rural/urban areas through incentives.			√		Himurja	PRIs/CSOs/ NGOs
			Strict compliance to air quality standards in industrial areas.			√		HPPCB	DEST / Department of Industries
			Strengthen awareness campaigns & monitor air quality in urban areas.			√		HPPCB	ULBs Transportation, Department of Industries
			Strengthening of existing awareness campaigns for promoting safe/cleaner fuel & solar energy usage.			√		Himurja	NGOs/ CSOs / DEST

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	I	P	Project	Coordination Agencies	Collaborating Agencies
			Strengthen awareness campaigns & monitor their performance.			√		DEST	Health/Himurja/ NGOs/CSOs
			Design & promote crematorium, which minimise consumption of fuel wood. Promote electric crematorium.				√	MCs	ULBs, RWAs, Citizens groups.
6. Lack of awareness about health issues & practices	Limited reach & extent of public awareness campaigns due to topography/hilly terrain Lack of NGO/CSO participation	Health risks / increased burden of diseases / mortality	Accelerate/initiate actions for implementation of IEC programmes under each health scheme/programmes being implemented at State level.			√		Health & Family Welfare Department	DEST/IPH/Rural Development Departments/ PRIs/CSOs
			Design & Initiate awareness generation programmes/projects with NGOs/CSOs.			√		Health & Family Welfare Department	CSOs/NGOs
7. Inadequate health infrastructure	Inadequate mechanism for drugs availability and distribution Inadequate capacity of health infrastructure / facilities including buildings & equipment Shortage of trained medical / paramedical staff at PHC / CHC level Lack of NGOs/ CSOs & Private Sector participation in health care system	Health Risks / Increased burden of disease / mortality.	Accelerate/initiate actions for drugs distribution envisaged in project implementation plan of NRHM for the State.				√	Department of Health & Family Welfare	TCP, Rural Development Departments/ PRIs/ NGOs/CSOs
			Accelerate/initiate actions for health infrastructure development.				√	Department of Health & Family Welfare	Rural Development Departments/PRIs/NGOs/CSOs
			Accelerate/initiate actions for hiring medical/paramedical staff on contract basis.				√	Health & Family Welfare Department	Rural Development Departments/PRIs/NGOs/CSOs
8. Health deterioration due to malnutrition	Poor nutrition to vulnerable social segments, e.g., BPL families / Infants/mothers.	Health risks/mortality .	Accelerate/initiate actions under RCH component of NRHM.				√	Health & Family Welfare Department & Social Justice	Rural Development Departments/PRIs

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	P :t	Coordination Agencies	Collaborating Agencies
								& Empowerment	
			☐ Monitoring of Infant/maternal nutrition supplement programmes under different schemes.			√		Health & Family Welfare Department	Rural Development Departments/PRIs/NGOs/CSOs
9. Occupational health of workers in industries	☐ Inadequate ventilation, cleanliness, sanitation and safe working practices.	☐ Health risks/increased disease burden.	☐ Strict monitoring of workers' health.			√		Directorate of Factories	Rural Development Departments/PRIs/NGOs/CSOs DEST, HPPCB
			☐ Implementation occupational health & safety (OHS) management system.				√	Industry	Consultant, Directorate of Factories, Department of Health & Family Welfare
10. Communicable diseases due to tourism (HIV/AIDS)	☐ Proliferation of HIV/AIDS due to unsafe practices. ☐ Lack of awareness.	☐ Health risks / increased disease burden.	☐ Implementation of prevention, care & support & treatment components under National AIDS Control Programme – III. This includes implementation of Information, Education, Communication & Capacity (IEC) building campaigns.			√	√	Health & Family Welfare Department & Higher Education	NGOs, CSO, PRIs, ULBs DEST
11.I nadequate infrastructure for management of hazardous waste, biomedical waste, radioactive waste.	☐ Improper siting. ☐ Inadequate treatment and disposal. ☐ Mixing of wastes from different streams.	☐ Health. risks/increased disease burden.	☐ Segregation of wastes from different streams. ☐ Undertake need assessment for setting up new treatment and disposal facilities.				√	HPPCB	Department of Health and Family Welfare, Health Institutions (Private / Government) ULBs, MCs
12. Inadequate Monitoring & Evaluation.	☐ Inadequate awareness. ☐ Inadequate staff. ☐ Inadequate capacity & skills.	☐ Early warning system of health epidemics/ disease outbreak not functional.	☐ Undertake training need assessment and prepare capacity building plan including hiring of specialised and skilled staff. ☐ Launch awareness programmes.			√		Health & Family Welfare Department & Social Justice & Empowerment	Health Institutions (Private/Government) ULBs MCs
13. Inadequate	☐ Lack of specialised	☐ Health	☐ Assess and identify gaps in R&D					Directorate of	Department of Health & Family Welfare,

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordination Agencies	Collaborating Agencies
Research & Development (R&D) & medical professional course/training & retraining for existing staff in emerging health issues.	& super specialty health institutions in the State. Lack of trained health professionals/ paramedical staff.	risks/increased disease burden. Projected growth in Health and Tourism may not be realized.	in view of new & emerging health risks & diseases. Undertake need assessment of setting up new super specialty health institutions in the State to address R&D needs, medical professional course & training including paramedical staff. Seek accreditation for existing & new health institutions undertaking R&D, imparting medical professional courses & trainings.					Medical Education.	Medical Council of India.

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 32. These monitoring requirements should be strictly followed for critically polluted and vulnerable areas.

- **Water Quality Monitoring and Reporting**

  Collect the data both for surface and groundwater (district wise) and analyse the trends and level of contamination. This should be carried out at the source and at household levels. This data should be processed, analysed and published monthly. The water quality parameters should be tested as per IS 10,500.

- **Air Quality Monitoring and Reporting**

  Monthly monitoring of air quality in critically polluted urban areas should be carried out as per national ambient air quality standards. All the monitored data has to be documented, reported and published by the relevant departments on quarterly basis.

- **Monitoring and Reporting of Disease Occurrence**

  Monthly monitoring of water and air borne disease occurrence should be carried out. Data of hospitalisation and mortality should be recorded every month. The monitoring report has to be documented and reported quarterly by the coordinating Department.

- **Monitoring and Reporting of Malnutrition Cases**

  Annual monitoring of occurrence of infant/child/mother/women malnutrition cases should be carried out. The monitoring report has to be documented and reported quarterly by the coordinating Department.

- **Monitoring and Reporting of HIV/AIDS**

  Occurrence of HIV/AIDS should be monitored and recorded every month in each district. This should be documented and published on quarterly basis.

- **Monitoring and Reporting of Occupational Diseases**

  Regular inspections should be carried out in industries and data related to work place diseases should be recorded, documented and published every year.

- **Monthly Monitoring has to be Carried out for the Following:**

  - Health infrastructure (PHC/CHC).
  - Cleaning of storage tanks and source of water.
  - Checking of water source supply.
  - Sanitation infrastructure e.g., pit latrines, trash bins, compost pits.
  - Biomedical waste collection, treatment and disposal.

All the above have to be documented and reported to the relevant Departments on quarterly basis. Also, the remedial measures taken to mitigate the situation have to be documented.

- **Awareness Programmes to be Conducted**

  Annual tracking of awareness programmes / campaigns needs to be carried out. The areas include the health and preventive and curative aspects related to diseases occurring on account of sanitation, health, water supply and personal hygiene, food and nutrition, HIV/AIDS and exposure to air pollution. Conduct annual surveys to find the effectiveness of different campaigns and reformulate the communication strategy of the awareness programmes.

- **Creation of Common Platform for Inter-Departmental Coordination**

  Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update of State Government website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on health sector and environment in the State. This chapter will summarise the analysis of the monitored data and performance of the sector based on following performance indicators.

Performance Indicators

For macro-level management of identified health issues and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators, as outlined in Table 32, will have to be monitored and reported by the concerned coordinating agency/Department.

Table 32: Performance Indicators

Outcomes	Indicators
1. Implementation of health improvement programmes/projects.	☐ Reduced/increased percentage of water borne disease occurrence. ☐ Reduced/increased percentage of HIV/AIDS case occurrence. ☐ Reduced/increased percentage of cases at work place. ☐ Reduced/increased percentage of infant and other malnutrition cases. ☐ Number of programmes/projects identified and implemented to address each issue.
2. Inter-sectoral coordination and integrated planning.	☐ Planning Department performing the function of co-ordination and supervision to ensure whether the given performance indicators are being achieved and sort out inter-Departmental issues, which is required especially when a large number of Departments are involved. ☐ Creation of Inter-sectoral forums/platforms. ☐ Regular meetings of such forums. ☐ New and effective enforcement mechanisms in force.
3. Awareness about the issues.	☐ Number of awareness campaigns conducted on each issue via different media. ☐ Number of trainings imparted to various State Department officers. ☐ Creation of data bank at coordinating agency and regular publications on State Government website on the state of water, air, waste & health scenario and its implications.

5.4 Road & Transport

Proposed actions to address specific road infrastructure and transportation issues and type of response has been identified and described in Table 33. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. Therefore, focusing and channelising their course of work is essential in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 33 clearly delineates these agencies.

Table 33: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Lack of Access due to Poor Road Connectivity.	▯ Lack of availability of infrastructure facilities, collection facilities. ▯ Expensive transportation.	▯ Loss/wastage of produce and increased pollution. ▯ Deterioration in quality of produce . ▯ Input resource loss, e.g., fertlisers, soil nutrients, water.	▯ Development of State Highway Master Plan in line with Tourism Master Plan, horticulture development plan and other State plans.		√		√	PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.
			▯ Development of State Rural Road Master Plan for rural roads, connecting roads in line with Tourism Master Plan, horticulture development plan and other plans.		√		√	PWD	Rural Development Department, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Urban Development, Department of Tourism, Department of Transportation, Department of Industry.

2. Poor Road Conditions Leading to Delayed Access to Warehousing as well as Markets.	Lack of maintenance of road infrastructure. Poor traffic management. Input resource loss.	Loss/wastage of produce & increased pollution. Deterioration in quality of produce. Input resource loss, e.g., fertlisers, soil nutrients, water.	Prepare State Highway/rural road upgradation plan as part of State Highway & Rural Road Master Plan.			√	PWD	Rural Development Department, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, Department of Urban Development, Department of Tourism, Department of Transportation, Department of Industry.
3. Development of New Road Infrastructure Leading to Associated Environmental Problems.	Change in land use. Activity generation.	Habitat degradation. Air pollution. Water pollution. Soil erosion. Land use change.	Develop rural roads infrastructure as per Indian Roads Congress codes.			√	PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities.
			Make Environment Impact Assessment & Environment Management Plan mandatory for all development of new State Highways. Provisions of funding mitigation measures as part of Environment Impact Assessment & Environment Management Plan should be made mandatory as part of project cost.	√			PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.

	Carry out strategic environmental assessment (EA) for State Highway/Rural Road Master Plan.		√	Steering Committee of Secretaries.	PWD, DEST, ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.
	Monitor both State Highway & Rural Road Master Plan as per EA's recommendation.		√	Steering Committee of Secretaries.	PWD, DEST, ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.
	Monitoring muck disposal plan of all State/National rural road project as part of Environment Management Plan.		√	PWD	DEST, PRIs, Infrastructure Developers, Operators, NGOs, CSOs, ULBs, IPH, Department of Urban Development, Department of Tourism, Department of Transportation, Department of Industry.

				Develop environmental training and capacity building plan for PWD/other stakeholders as part of strategic EA plan.		√	Department of Environment,Science & Technology	PWD, PRIs, Infrastructure Developers, Operators, NGOs, CSOs, ULBs, IPH, Department of Urban Development, Department of Tourism, Department of Transportation, Department of Industry.
4. Development of Road Infrastructure Leading to Unplanned/Unauthorised Urbanisation in both Rural and Urban Areas.	Fragmentation of habitat. Loss of flora and fauna. Unauthorised shops and encroachment adjacent to right of way both in rural and urban areas.	Soil erosion. Restricted movement leading to safety hazards. Waste generation (Municipal Solid Waste & sewage). Congestion on the road.		Strict implementation of Municipal laws & bye laws.		√	ULBs/PRIs, PWD	PWD, Infrastructure Developers, Operators, NGOs, CSOs, IPH, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.
				Strict implementation of laws related to environment at State & National Highways.		√	ULBs/PRIs, PWD	PWD, Infrastructure Developers, Operators, NGOs, CSOs, IPH, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.

				Strict implementation of State Highways/Rural Road Master Plan & strategic road sector Environment Assessment plan.		√		Office of Chief Secretary	PWD, Infrastructure Developers, Operators, NGOs, CSOs, ULBs, PRIs, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.
5. Lack of Parking Infrastructure in Urban Areas Leading to Congestion and Air Pollution.	Lack of space at markets/commercial establishments, tourist places, religious places. Vehicle numbers exceeding planned development.	Traffic congestion. Air pollution. Safety/public health hazards.		Development of parking infrastructure as part of Urban Master Plan.			√	ULBs	PWD, ULBs, PRIs, Department of Urban Development, Department of Rural Development.
				Development of parking infrastructure as part of Tourism Master Plan.			√	Department of Tourism	PWD, ULBs, PRIs, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.
				Ensure Private Sector participation in parking infrastructure.			√	ULBs/PRIs	PWD, ULBs, PRIs, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.

				Strict implementation of traffic rules.		√		Himachal Police	PWD, ULBs, PRIs, Department of Urban Development, Department of Rural Development, Department of Transportation, Department of Industry.
6. Traffic Congestion at Tourist Spots in Rural Areas leading to Problems, such as Air Pollution and Waste Generation.	Ad hoc development in the absences of planned development.	Air pollution. Waste generation. Safety/public health risks.		Identify and privatise places of tourist interest, where traffic is a bottleneck.		√		Department of Tourism	Department of Urban Development, Department of Rural Development, PWD, PRIs, Department of Transportation, Department of Industry.
				Develop traffic management plan for specific tourist places, where traffic is a bottleneck, e.g., Rohtang pass, Kufri.		√		Department of Tourism	Department of Urban Development, Department of Rural Development, PWD, PRIs, Department of Transportation, Department of Industry.
				Monitoring of air quality at specific tourist spots.		√		HPPCB	Department of Tourism, DEST, PRIs .
7. Lack of Traffic Management in Urban Areas Leading to Air and Noise Pollution	Lack of traffic management during peak tourist season.	Air pollution. Noise pollution.		Develop traffic management plans for urban areas.	√		ULBs	Infrastructure Developers, Operators, NGOs, CSOs, Department of Urban Development, Himachal Pradesh Police.	

			Monitoring Air & Noise Pollution.		√		Department of Urban Development	Consultant, IPH, ULBs, Departments of Health & Family Welfare, Department of Transportation, Department of Industry.
8. Poor Public Transportation in Urban Areas Leading to Traffic Congestion	Lack of alternate transportation system and inefficient operation of existing system, e.g., ropeways, combining existing public bus transportation with other modes.	Air pollution. Noise pollution. Safety/public health risks.	Develop urban transportation plan using alternate modes.	√		ULBs	PWD, DEST,	Himachal Police, ULBs, Department of Health & Family Welfare, Department of Transportation, Department of Industry
9Lackof Safetyand Public Health Risks due to Congested Road Infrastructure.	Migration of labor for new construction & upgradation of road infrastructure. Difficult operation of health infrastructure. Difficult access to health infrastructure.	Safety/public health risks.	Development & implementation of district-wise rapid response plan for accidents & other emergencies.	√		√	Accident/ Disaster Management Unit	Department of Health & Family Welfare, ULBs, Rural and Urban Development Departments, PRIs, NGOs, CSOs, IPH, ULBs.
			Repatriation of migrant labor should be made mandatory as part contractor's contractual conditions. Contractor should be penalised for non-compliance.	√			PWD	Department of Health and Family Welfare, ULBs, Rural and Urban Development Departments, PRIs, NGOs, CSOs, IPH, ULBs, Department of Transportation, Department of Industry.

10. Lack of Resources for Road / Highway Upgradation and Infrastructure Development.	Lack of Private Sector participation in road infrastructure development. Lack of resources results in decreased environmental management.	Non implementation / mainstreaming of environmental & safety safeguards.	Ensure Private Sector participation in road infrastructure development.		√	PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.
			Project development under PPP.		√	PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.
			Environmental budget should be prepared for implementing mitigation measures as part of DPR.		√	PWD	ULBs, Department of Urban Development, Department of Rural Development, PRIs, NGOs, CSOs, Municipalities, Department of Transportation, Department of Industry.

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 34. These monitoring requirements should be strictly followed for critically polluted and vulnerable areas.

Monitoring and Reporting of State Highway / Rural Road Master Plan: Monitoring of Tourism Master Plans should be carried out every year to report deviations and slippages.

Monitoring and Reporting of Urban Transportation Plans: Monthly monitoring of urban transportation plan should be carried out.

Monitoring and Reporting of Strategic Environmental Assessment of State Road Sector: Monthly monitoring of Strategic Environmental Assessment of State road sector should be carried out.

Monitoring and Reporting of State Road as per EIA and EMP: Monthly monitoring of State road as per Environment Impact Assessment and Environment Management Plan should be carried out.

Monitoring and Reporting of Water Quality / Sanitation/Solid Waste: Collect the data both for surface and groundwater (district-wise) and analyse the trends and levels of contamination. This should be carried out at the source and at sources located at tourist transit points/dhabas and tourist destinations. This data should be processed, analysed and published quarterly. The water quality parameters should be tested as per IS 10,500. Monitoring of sanitation and solid waste at tourist transit points/dhabas and tourist destinations should be carried out and published quarterly.

Air Quality Monitoring/Reporting: Monthly monitoring of air quality in critically polluted urban areas/tourist areas including heritage sites, tourist spots should be carried out as per National Ambient Air Quality Standards (NAAQS). All the monitored data has to be documented, reported and published by the relevant Departments on quarterly basis.

Monitoring of Accident Occurrence / Reporting: Monthly monitoring of accident occurrence / reporting should be carried out.

Monitoring of Number of Challans Issued: Monthly monitoring of number of challans issued in every district should be carried out. This should be documented, reported on monthly and yearly basis.

Monitoring of Awareness Programmes to be Conducted: Annual tracking of awareness programmes/campaigns needs to be carried out.

Creation of Common Platform for Inter-Departmental Coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update of Government of Himachal Pradesh website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a Chapter on road, transportation sector and environment in the State. This Chapter will summarise the analysis of monitored data and performance of the sector based on following performance indicators.

Performance Indicators: For macro-level management of the vehicular traffic, air

quality and infrastructure issues identified and to gauge the performance of the above proposed actions, following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 34 will have to be monitored by the coordinating agency / Department.

Table 34: Performance Indicators

Outcomes	Indicators
1. Implementation of health improvement programmes /projects.	Reduced/increased number of de-licensing of *dhabas* on account of environment.. Reduced/increased number of *challans* issued to non-compliant vehicles either for pollution or parking. Number of programmes/projects identified and implemented to address each issue. Deterioration/improvement in air quality.
2. Inter-sectoral coordination and integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New and effective enforcement mechanisms in force.
3. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers and staff of PWD. Creation of data bank at coordinating agency and regular publications on State Government website on the state of water, air, waste and its implications. Reduction/increase in number of road accidents. Reduction/increase in number of traffic jams at major congestion points. Reduction/increase in number of vehicles in each district (rural and urban).

5.5 Mining & Geology

Proposed actions to address specific Mining and Geology issues and type of response have been identified and described in Table 35. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 35 clearly delineates these agencies.

Table 35: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues / Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agency	Collaborating Agency
1. Siting of mining areas.	☐ Mining deposits are site specific & have to be developed & mined/operated only where they exist. Hence, it is all the more important to select proper mining sites, which causes the least damage to environment.	☐ Disturbance to environment, forest land, fertile land, etc. ☐ Problems due to land acquisition and rehabilitation of land and persons displaced. ☐ Disturbance to vegetation growth along with bio-diversity and fauna of the area. ☐ Air, water and noise pollution. ☐ Land degradation and waste disposal etc. ☐ Loss of aesthetic beauty etc.	☐ Proper appraisal of the mineral deposit with respect to environmental issue. ☐ Concept of sustainable development to be kept in view while considering mining projects. ☐ If all clearances have been granted for mining lease, strict implementation of mining plan, mine closure plan, EIA/EMP documents, Pollution Control Board conditions of the Consents, MoEF / Forest Department conditions of the consents etc. should be carried out. ☐ Strict monitoring of all environmental issues.			√	√	Dept. of Industries, Mining & Geology	Planning Department, HP State Land Use and Wasteland Development Board, Dept. of Industries, Central Pollution Control Board, Himachal Pradesh Pollution Control Board, Industry Associations Department of Environment Science & Technology NGOs / CSOs
2 Ambient Air Quality/air pollution due to dust generated during various mining processes.	☐ Dust generated due to various mining activities causing air pollution. ☐ Drilling ☐ Blasting ☐ Loading and unloading of mined materials ☐ On haulage roads, transportation of material through trucks. ☐ Fixed sources, like crushers, screen, conveyors, etc. ☐ Air borne dust due to wind action.	☐ The consequences of air pollution due to dust generated during mining operations may impact: ☐ Visible plumes and haze. ☐ Staining and soiling of surfaces. ☐ Aesthetic or chemical contamination of vegetation or water bodies. ☐ Effect on personal comfort, amenity and health. ☐ Occupational health hazards, like: ☐ 'Silicosis' a serious life threatening lung disease caused due	☐ To identify potential sources of dust. ☐ Prediction of dust levels likely to occur near the mines site. ☐ Evaluating the potential of dust particles to affect environment and human health. ☐ Incorporating dust predictions and control measures into mine planning and design, which include: ☐ Dust to be controlled by erecting enclosures. ☐ Internal roads to be surfaced. ☐ Dust to be suppressed by water sprays. ☐ Green barriers along mine roads. ☐ Before charging and blasting, consider atmosphere conditions.			√ √	√	Project Proponent	Department of Industries, Mining & Geology Dept. of Urban Development/ ULBs Central Pollution Control Board, Himachal Pradesh Pollution Control Board,Dept of Transport Himachal Pradesh Public Works Department HP Infrastructure Development Board Department of Environment Science & Technology.

Issues / Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agency	Collaborating Agency
		to mining and quarrying of silicate minerals. ‘Mesothelioma, a type of cancer caused due to exposure to asbestos mining – also termed as – ‘asbestosis’. Dusts containing metals, which are toxic like lead, mercury, zinc, cobalt, etc.	Regular monitoring for SPM (Suspended Particulate Matter), NO_X (Oxides of Nitrogen) and SO_2 (Sulphur Dioxide) levels at fixed locations.						
3. Water quality/water pollution/depletion of water sources.	Water pollution may be caused by direct discharge of mine waste into water streams. Due to erosion and wash off from mined out areas and waste dumps. The water drained may be charged with suspended solid particulates, dissolved chemicals and toxic substances, or may be acidic, alkaline, or polluted by acid mine drainage not fit for the survival of fish and benthic invertebrates.	Impact of mine drainage on water regime due to degradation of surface and sub-surface water quality. Alteration of surface run off and stream flow. Water pollution could cause following harmful effects: Rise in turbidity and suspended matter. Rise in temperature by a few degree Celsius (ºC). Aesthetic pollution due to change in colour due to toxic elements. Foam and froth due to mineral beneficiation. Radio-activity.	To follow zero discharge policy into natural water sources, thereby eliminating the causes of contamination. Recycling of water and setting up of water treatment plants. Suitable treatment of water passing through a settling tank before discharging into natural courses. Water to be systematically stored and used for plantation. Bench the slopes inward. Proper drains towards hillside to be constructed for proper drainage of rain water.			√	√	Project Proponent	Department of Industries, Mining & Geology Dept. of Urban Development/ ULBs CPCB, HPPCB Dept of Transport Himachal Pradesh, Public Works Department, Department of Environment, Science & Technology

Issues / Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agency	Collaborating Agency
		▯ Lowering of water table and depletion of water resources.							
4. Noise pollution	▯ The noise generated due to mining and allied equipments arises from: ▯ Working of machinery like loaders, dozers, locomotives, etc. ▯ Fixed plant installations, like crushers, conveyors, pumps, ventilation fans. ▯ Mobile plants, like compressed air rock drills, large portable compressors, diesel, trucks, front end loaders, etc. ▯ Blasting activities.	▯ Exposure to noise beyond certain level is harmful to human health and efficiency. ▯ The generation of unreasonable noise within the environment affects people adversely. ▯ Interference with sleep. ▯ Effect on hearing ▯ Effect on communication ▯ Effect on mental and physical health. ▯ Effect on working efficiency. ▯ Continuous exposure of workers to high levels of noise may result to: Annoyance	▯ For abatement of noise: ▯ Barriers to acoustic line of sight serve as feasible solutions. Barriers may be: ▯ Walling ▯ Planting ▯ Control of noise by: ▯ Reducing sound at source. ▯ Interrupting the path of noise. ▯ Protecting the receiver. ▯ Other techniques Such as ▯ Reducing time of exposure. ▯ Lubrication maintenance and speed rating. ▯ Design of equipments ▯ Green belts. ▯ Ear protection ▯ Controlled blasting.			√	√	Project Proponent	Department of Industries, Mining & Geology Dept. of Urban Development/ ULBs CPCB, HPPCB Dept of Transport HP PWD DEST

Issues / Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agency	Collaborating Agency
		Fatigue Hypertension Loss of hearing Temporary shift in threshold limit of hearing. Other anatomical disturbances, like change in breathing amplitude, gastric secretion, etc.							
5. Waste management	Removal of over-burden and inter-burden. Refuse from ore processing plants including slimes, mud and tailings. Waste from lubricants, oil and grease from mining machinery. Disposal of sub-grade mineral.	External dumps are permanent sources of land pollution as they get washed off with rains and cause air borne dust through wind action. They look ugly and repulsive. In hilly areas, the waste flowing through natural surface destroys vegetation, chokes natural drainage and the run off during rainy season; and spoils the surrounding landscape in terms of stability and natural land form.	No mining to be allowed where ore overburden ratio is more than 1: 0.20. Disposal of over-burden and waste to be done at predetermined locations as per the mining plan. Location to be properly designed for stabilisation and re-vegetation and to resist long term erosion. Proper drainage to be constructed to handle heavy rainfall events. Appropriate garland drains to be provided all around. Proper aesthetic to the waste dumps be given in relation to the surrounding landscape, so that the area blends with the natural land after rehabilitation.	√		√	√	Dept. of Industries Mining & Geology Project Proponent	Department of Industries, Mining & Geology Dept. of Urban Development/ ULBs Central Pollution Control Board, Himachal Pradesh Pollution Control Board, Department of Transport, Himachal Pradesh Public Works Department, Department of Environment Science & Technology
6. Change in land use.	Mining is a temporary land use and is not an everlasting process. The land use pattern undergoes a change due to the use of	Where communities exist at a potential mine site, mining impacts on the	Any substantial change from the pre mining land form should be contemplated only after full consultation with the local community,			√	√	Dept. of Industries, Mining & Geology	Department of Industries, Mining & Geology Dept. of Urban

Issues / Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agency	Collaborating Agency
	land for mining, excavation, dumping and other associated activities.	lost environment can significantly influence community attitude to the operation. Change in topography. Change in local drainage patterns etc.	regulatory authorities and research has been undertaken. The post mining land form, drainage and vegetation association should be stable, self sustaining, visually compatible with surrounding land and also meet community expectation. Strict compliance of Mine Plans and Mine Closure Plans, which are approved by Indian Bureau of Mines, Government of India.					Project Proponent	Development/ ULBs CPCB, HPPCB Dept of Transport HP PWD DEST
7 Loss of flora and fauna.	The mining operations cause change in the density of flora and also affects the plantation in the core as well as buffer zones. Impact on fauna due to noise, land degradation and deforestation also results because of change in the land use.	Loss of natural vegetation cover. Fleeing away of fauna	Strict implementation of compensatory afforestation plan as part of EIA/EMP and the mining plan. Cataloguing individual species for identification of rare and endangered plants and animals. Minimising impacts of mines on flora and fauna through proper layout and designs. Proper top-soil management for ensuring proper rehabilitation of land by plantation.			√	√	Department of Forests	Planning Department, HP State Land Use and Wasteland Development Board Department of Industries, Mining & Geology HPPCB DEST Forest Department Forest Survey of India DEST
8.Poor Aesthetics/visual impacts	Mining activities remove vegetation cover, modify the land forms, create colour contrasts and impose man-made objects into natural vistas.	Looks like an eye sore	Improve aesthetic beauty by planning proper location of dumps, plants, residential areas along with plantation. Visual safeguards. like tree screens & screening with bunds to be considered. Proper check dams for controlling the debri flow to improve aesthetic of the area. Contouring or reshaping the worked out benches/pits or dumps of waste rock.			√	√	Department of Industries mining & Geology Department of tourism, Department of Environment Science & Technology	Industry Associations, Planning Department, HP State Land Use and Wasteland Development Board, Forest Department, Forest Survey of India

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 36. These monitoring requirements should be strictly followed for Mining and Geology Sector.

The Himachal Pradesh State Pollution Control Board, in consultation with the Central Pollution Control Board, shall collect, compile, and publish technical and statistical data relating to air, water and noise pollution and measures devised for its effective prevention, control and abatement.

Monitoring system should be strengthened for monitoring of the air, water, noise quality and waste management.

Strict monitoring of conditions given in 'Consent to Establish' and 'Consent to Operate' should be carried out and implemented.

Strict monitoring of Environment Management Plans for Industrial and Mining Projects should be carried out and implemented.

Performance Indicators: For macro-level management of Industries, Mining and Geology related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators, as outlined in Table 36, will have to be monitored and reported by the concerned coordinating agency / Department.

Table 36: Performance Indicators

Outcomes	Indicators
1. Improved Ambient Air Quality.	Frequency of stringent monitoring of NAAQS in Industrial areas, particularly in those exceeding NAAQS. Number of penal actions taken.
2. Improved Water Quality.	Number of water sources and related habitats significantly affected by operations broken down by level of extinction risk (additional). Frequency of stringent monitoring of water quality in mining areas, particularly those exceeding water quality parameters. Number of penal actions taken.
3. Siting of Mining Areas.	Number of new mines following the siting criteria defined by CEPI (CPCB and MoEF). Location and size of land owned, leased, or managed in bio-diversity-rich habitats. Description of major impacts on bio-diversity associated with activities and/or products and services in terrestrial, fresh-water, and marine environments. Number of penal actions taken.
4. Restoration of mined areas.	Number of mines following the Environment Management Plans in letter and spirit.

Outcomes	Indicators
	Mined area restored (in hectares). Changes to natural habitats resulting from activities and operations. Number of IUCN Red List species with habitats in areas affected by operations broken down by level of extinction risk (additional). Number of penal actions taken
5. Improved Waste Management.	Number of new Hazardous Waste Management facilities set up and operational. Number of penal actions taken.
6. Change of land use & improved aesthetics.	Location and size of land owned, leased, or managed in bio-diversity-rich habitats. Total amount of land owned, leased, or managed for production activities or extractive use. Business units currently operating or planning operations in or around sensitive or protected areas. Total land disturbed and not yet rehabilitated (opening balance). Total amount of land newly disturbed within the reporting period. Total amount of land newly rehabilitated within the reporting period to agreed upon end use. Total land disturbed and not yet rehabilitated (closing balance). Number of penal actions taken.

5.6 Industry

Proposed actions to address specific Industry Sector issues and type of response have been identified and described in Table 37. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelize their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 37 clearly delineates these agencies.

Table 37: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Siting of mining areas.	☐ Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. ☐ The siting of Industries is being done as per the available land bank & not as per the Zoning Atlas for Industries.	☐ Over extraction of mineral resources & environment pollution.	☐ Undertake Regional Environmental Impact Assessments/Cumulative Impact Assessment. ☐ Complete Zoning Atlas for industrial siting & ensure its strict implementation. ☐ Preparation of region specific map for siting (in GIS environment). ☐ Preparation of region specific industrial siting guidelines. ☐ Revisiting land-use surrounding hazardous units (in case industry is already commissioned) ☐ Prepare district-wise Environmental Atlas. ☐ Proper appraisal of the site with respect to environmental issues. ☐ Concept of sustainable development to be kept in view while considering mining project.			√	√	Dept. of Industries	Planning Department, HP State Land Use & Wasteland Development Board, Dept. of Industries, CPCB, HP-PCB, Industry Associations DEST NGOs/CSOs

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			▯ If all clearances are through for grant of mining lease, adhere to strict implementation of mining plan, mine closure plan, Environment Impact Assessment / Environment Management Plan document, PCB conditions, MoEF/Forest Department conditions etc.						
			▯ Strict monitoring of all environmental issues.						
2 Ambient Air Quality/air pollution due to dust generated during various mining processes.	▯ Dust generated due to various mining activities causing air pollution.	▯ Exceedence of the National Ambient Air Quality Standards (NAAQS).	▯ Strict implementation of Urban Master Plan including zonation.		√		√	Dept. of Urban Development/ULBs	Dept of Industries
			▯ Preparation and implementation of green belt management plan and restoration of exposedareaaspartof industrial estate development plan.		√		√	-do-	-do-
		▯ Impact on human health, particularly that of industrial workers.	▯ Disposal of loose material at designated places.			√		Department of Industries	CPCB, HPPCB Dept of Transport HP PWD HP Infrastructure Development Board Department of Tourism

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
3. Deteriorating water quality and quantity.	☐ Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. ☐ Ancillary development in the industrial area including urban infrastructure entailing construction activities, improper discharge of industrial effluents (treated/untreated), sewage and Municipal solid wastes. ☐ Deeper excavation on the surface or underground digging.	☐ Further, deterioration of water quality in terms of benchmarks set in Primary Water Quality Criteria & Designated Best Use of Fresh Waters (A-E). ☐ Water table decreases locally, often drastically, resulting in drying up of wells & springs in the neighbourhood . ☐ Adverse effect on water users and the aquatic ecosystem. The impact is particularly significant if water users	☐ Optimisation of usage by introducing the concept of 3 Rs (Reduce, Recover & Recycling) & zero discharge industry. ☐ Prepare & implement water harvesting plan to ensure water conservation decreasing in areas of water table. ☐ Strictly monitor exposed area restoration plan as part of Environment Management Plan of mines. ☐ Strictly monitor water quality in mined areas and industries.				√ IPH Himachal Pollution Control Board	Department of Industries	CPPCB HPPCB DEST NGOs/CSOs Dept. of Industries Central Ground Water Board DEST Department of Industries, Industry, Association DEST Dept of Industries, HP Infrastructure Development Board Department of Tourism Industry Associations IPH, ULBs HP Infrastructure Development Board Department of Tourism

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
		situated downstream of the site are abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.							-do-
	☐ Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances, which cause water pollution.						Himachal Pollution Control Board		
	☐ Mining activities increase suspended solids and chemical contamination in the water at the site and downstream.								
4. Noise pollution	☐ Concentration of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources.	☐ Exceedence of the National Ambient Noise levels.	☐ Prohibit blasting operations in mines/industry.				√	Department of Industries	DEST, CPCB, HPPCB, Police, HP PWD HP Infrastructure Development Board Department of Tourism
	☐ Ancillary development in the industrial area including urban infrastructure entailing construction activities, vehicular movement, industrial operations etc.	☐ Noise drives away wild animals and birds from the nearby forest.	☐ Strict implementation of noise mitigation measures as part of Environment Management Plan.						DEST HPPCB
	☐ Noise and vibrations due to blasting & operation of	☐ Impact on					√		

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	machines & equipments used in the mines for various purposes including transportation of the overburden & mineral.	human health, particularly on that of industrial workers.	☐ Strict implementation of buffer zone management plan as part of industrial estate development plan.			√			DEST HPPCB Industry Association CSOs, NGOs
5. Inadequate hazardous waste treatment & disposal.	☐ Congregation of industries in Shivalik Himalaya & focus on the extraction of a few mineral resources. ☐ Hazardous waste inHimachal Pradesh comprises Sludge from Effluent Treatment Plants, Waste Oils, Contaminated Containers, Others (Residual wastes) & Process Residue. ☐ Gaps in Hazardous Waste Generation & treatment. ☐ Inadequate number of Common Effluent Treatment Plants (CETPs) & treatment, e.g., no CETP for Baddi and	☐ Gaps between hazardous waste generation & treatment may increase further leading to deterioration of water quality.	☐ Strict implementation of Hazardous waste management plan as part ofEnvironment Management Plan.				√	Department of Industries	HPPCB, DEST
			☐ Implementation of hazardous waste infrastructure development plan, e.g., Commom Effluent Treatment Plans/Treatment, Storage and Disposal Facility.			√		Industry Association	HPPCB, DEST
			☐ Strict monitoring of hazardous waste generation & disposal.			√		HPPCB	DEST, Industries, Industry Association CSOs, NGOs.

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	Barotiwala areas.								
6. Land degradation.	☐ The land use pattern undergoes change due to use of land for mining, excavation, dumping & other associated activities. ☐ Digging of open pits & dumping of overburden rock mass in the form of heaps. ☐ Polluted water from pits affects the characteristics of the topsoil, thus, affecting the end use. The damage pattern on the surface undergoes change due to alterations in the surface topography because of mining and associated activities.	☐ The land use in the surrounding areas is affected due to the impact of mining on water regime. ☐ Change in value of the land& surrounding areas.	☐ Development & implementation of exposed area restoration plan as part of Environment Management Plan of mined areas. ☐ Restoration/conservation of industry & mine area drainage pattern as part of exposed area restoration plan. ☐ Strict implementation of Catchment Area Treatment integrated with exposed area restoration plan.			√	√	HPPCB Department of Forests	Revenue Department, Planning Department, HP State Land Use & Wasteland Development Board, Industry Associations, HPSEB, HP PCL, HIMURJA, SJVNL Department of Energy, HP PWD HPPCB, DEST IPH Industry Associations
7 Loss of flora & fauna.	☐ Removal of all vegetation (flora) & fauna from the area for mining & other purposes. ☐ Pollution of water in the surrounding water bodies, due to flow of debris on the slope,	☐ Loss of natural vegetation cover by clear felling, smothering and dust	☐ Strict implementation of compensatory afforestation plan as part of Environment Management Plan. ☐ Strict implementation of buffer zone management plan as part of industrial estate development/mine development areas				√	Dept. of Forests Dept. of Industries	Planning Department, HP State Land Use & Wasteland Development -do-

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	affects the aquatic ecology of water bodies. □ Dust in the atmosphere is caused by mining & associated activities. Dust when deposited on the leaves of the plants in the surrounding areas, retards their growth		□ Formulation & implementation of an integrated compensatory afforestation, buffer zone management plan. □ Monitoring of green cover.				√	Office of Chief Secretary -do-	All Line Departments Forest Department Forest Survey of India
8 Poor aesthetics.	□ Improper siting of Industries. □ Removal of vegetation from the mining area & flow of debris on the slope give an ugly look.	□ Change in land use. □ Change in value of the land& surrounding areas.	□ Strict implementation of landscape restoration plan as part of exposed area restoration plan. □ Monitoring of green cover.			√		Department of Industries	Industry Associations, Planning Department, HP State Land Use and Wasteland Development Forest Department Forest Survey of India
9 Inadequate infrastructure & civic amenities in the industrial areas.	□ Improper siting of Industries/Industrial Areas.	□ Pressure on existing infrastructure & civic amenities.	□ Promote development of State of Art Industrial Areas.				√	Industries Department	Himachal Pradesh State Industries Development Corporation

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	▯ Inadequate need assessment of infrastructure & civic amenities. ▯ Inadequacies in perspective/Master Plan for Industrial Areas.		▯ Creation of Area Specific Statutory Development Agencies & entrust them with the task of managing urban growth in areas of their jurisdiction & for ensuring creation & strengthening of planned growth of social, housing, health, commercial and other related infrastructure. ▯ Promote self certification for industrial units including approval of building plans for specified plot sizes would be automatically deemed to have been given, provided the units certify themselves that they have adhered to the basic norms.				√ √		(HPSIDC), Himachal Pradesh Housing and Urban Development Agency (HIMUDA), Area Specific Development Agencies, Town & Country Planning Department/ HPSIDC.
10 Inadequate carrying capacity based planning process.	▯ Improper siting of Industries/Industrial Areas. ▯ Inadequacies in perspective/ Master Plan for Industrial Areas. ▯ Ribbon development.	▯ Pressure on existing infrastructure & civic amenities. ▯ Haphazard growth, leading to ribbon development.	▯ Promote cluster based approach to industrial development. ▯ Prioritisation of industries that can be promoted in Himachal Pradesh. ▯ Promote industries categorised as green rather than those listed as orange and red.			√		Industries Department	HPSIDC

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	☐ Inadequate attention to promote cluster based approach for development of Industries / Industrial Areas.		☐ Promote and incentivise non polluting industries, e.g., IT, Biotechnology. ☐ Capacity building / strengthening of ITIs to develop a cadre of trained professionals.						
11 Limited technological options to switch to green/clean technologies	☐ Inadequate incentives for setting up / switching to green / clean technologies. ☐ Inadequate understanding of green/clean technologies, which could be introduced in Himachal Pradesh.	☐ Deterioration of baseline environment conditions of land, water, air & noise. ☐ Increased capital cost & investment for setting up / switching to green / clean technologies.	☐ Identify the areas where introduction of clean technologies is possible; ☐ Identify the source(s) from where clean technology and data/details thereof can be obtained; ☐ Assess the technology available indigenously as well as those to be imported; ☐ Modify the technology, if necessary and demonstrate it to the satisfaction of the users, so that it can be replicated; ☐ Undertake Research and Development to develop technologies for cleaner production; ☐ Collect, collate and disseminate information on clean technology; ☐ Maintain interaction with the industry, financial institutions and Research			√		Industries Department	HPPCB DEST

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			and Development Laboratories for adoption of clean technologies.						
12 Impact of cement industry on tourism and transportation sector	☐ Growth in cement industries in State as a result of Industrial Policy focus on utilisation of limestone resources ☐ Inadequate infrastructure including roads to assimilate unplanned growth in the cement industry.	☐ Impact on Ambient Air and Noise Quality ☐ Deterioration of quality of roads and related infrastructure ☐ Reduced inflow of tourists	☐ Regulate the new cement industries based on the master plan of the given Industrial Area	√				Industries Department	HPPCB, DEST, Cement Manufacturers, Industry Associations
13 Inadequate transport management & infrastructure for transporting industrial & agri-horticultural produces.	☐ Inadequate assessment of planning for infrastructure needs including transportation infrastructure.	☐ Increased pressure on available infrastructure for transportation of industrial & agri-horticultural produce.	☐ Evolve an efficient mechanism on competitive rates, so that transportation of raw material and industrial products is smooth & on competitive rates.			√		Industries Department	Industry Association Transporters' Association
		☐ Deterioration of baseline environment conditions, especially that of air, noise and water.	☐ Foster conducive environment of mutual appreciation and trust between Industry and Transport Unions and encourage regular dialogues between them so as to solve contentious issues at the local level.						

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
14 Issues related to migration, labour, housing & health.	☐ Influx of migratory work force (skilled/unskilled) in and around Industrial Areas. ☐ Inadequate civic amenities in & around Industrial Areas. ☐ Inadequate Social Infrastructure (housing facilities, health, educational institutions etc.).	☐ Social unrest in view of increased migration. ☐ Deterioration of quality of life in the existing urban/peri-urban areas & around Industrial Areas. ☐ Rise in the instances of communicable diseases.	☐ Demarcate specific areas around such industrial clusters where housing infrastructure could be created both in the Government & Private sector. Permission for purchase of land for captive housing would be given in a time bound manner to the industrial units set up in the State. ☐ Ensure supply of power & water to such housing complexes. ☐ Encourage Industries to tie up with local adjoining *Panchayats* and villages for arranging captive accommodation by helping such villagers augment their accommodation so as to cater to the specific needs of the workers, who could be housed in such units. ☐ Prepare Master Plan for new and existing Industrial Areas, focusing on the provision of infrastructure, including social infrastructure.				√	Industries Department	Service Providing Agencies Utilities Departments Industry Association PRIs

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 38. These monitoring requirements should be strictly followed for the Industry Sector.

The Himachal Pradesh State Pollution Control Board, in consultation with the Central Pollution Control Board, shall collect, compile, and publish technical and statistical data relating to noise pollution and measures devised for its effective prevention, control and abatement.

Monitoring system should be put in place for monitoring of water intake for industrial supplies and use in industrial applications.

Strict monitoring of conditions given in Consent to Establish and Consent to Operate.

Strict monitoring of Environment Management Plans for Industrial and Mining Projects.

Performance Indicators: For macro-level management of Industry related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators, as outlined in Table 38, will have to be monitored and reported by the concerned coordinating agency/Department.

Table 38: Performance Indicators

Outcomes	Indicators
1. Improved Ambient Air Quality.	Frequency of stringent monitoring of NAAQS in Industrial areas, particularly those exceeding NAAQS. Number of penal actions taken.
2. Improved Water Quality.	Frequency of stringent monitoring of effluents of Common Effluent Treatment Plants (CETPs) in industrial areas, particularly those exceeding water quality parameters. Number of new Common Effluent Treatment Plants set up & provision of additional space for enhancing the capacity of existing Common Effluent Treatment Plants. Number of penal actions taken.
3. Improved siting of industries.	Number of new industries following the siting criteria defined by Comprehensive Environment Pollution Index (CPCB & MoEF). Number of new industries following the siting criteria as Zoning Atlas for Industries. Number of penal actions taken.
4. Restoration of mined areas.	Number of industries following the Environment Management Plans in letter and spirit Mined area restored (in ha) Number of penal actions taken
5. Improved Hazardous Waste Management.	Number of new Hazardous Waste Management Facilities is set up and operational. Number of penal actions taken.
6. Control of land degradation & improved aesthetics.	Number of new industries located as per the Master Plans of the given industrial area/corridor. Number of penal actions taken.

5.7 Energy

This section describes various 'Actions / Measures' that can help in minimising and mitigating the impacts derived from the issues identified in Section III. Table 39 delineates how various Departments can contribute in enhancing and maintaining the sector. Table 40 is an illustration of how proposed actions and their respective agencies are linked to show cross sector linkages.

Table 39: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Change in natural flow/hydrology and water dynamics of the reservoir/wetland/water body.	▫ Construction of a large number of reservoirs and dams; diversion of streams and rivers and hydro-electric projects lead to reduced flow into wetlands/water bodies/reservoirs. Further, the release of impounded water by dam/reservoir depends on the management authority. Small hydropower projects & other infrastructure development projects requiring water diversion also change the hydrology of the wetland/water body/river.	▫ Changes in Hydrological regime leading to variation in ecology of the small stream/*khud,* which in turn affects large streams & rivers. ▫ Ecological imbalance in aquatic flora & fauna including fisheries.	▫ Assessment of hydrology in the immediate catchment / river basin for small hydro projects.				√	Power Utilities	Directorate of Energy Himurja HPSEB, BBMB HPPCL, SJVNL, IPH, Departments of Fisheries, Forests & Wildlife DEST HP PCB
			▫ Assist line Department to ensure coordination between relevant authorities for the timing and volume of water release.		√	√			
			▫ Assessment of sustainable ecological flow (15% or more, whichever is higher).	√		√			
			▫ Ensure release of minimum 15% flow in downstream section of the river, which is made mandatory as stipulated in the Policy.						
			▫ Ensure monitoring of downstream flow.						
			▫ Assess effectiveness of the downstream flow.						
			▫ Cumulative Impact Assessment at basin level (Strategic Environmental Assessment prior to hydropower development).						
			▫ Guideline for Local Area Developmen Authority (LADA) to						

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			make it environmentally sustainable. □ Development of detailed Guidelines for every project with clear cut output on quid-pro-quo basis. □ Payment for Ecosystem Services (PES) for Energy sector. □ Earmark 1% of budget of the Catchment Area Treatment plan for PES through quid-pro-quo basis. □ Maintenance of Longitudinal Aquatic Connectivity of stream / river. □ River bed modification between diversion & tailrace outfall in a Run of River scheme, so as to derive higher environmental benefits from releasing downstream discharge. □ Fish pass is must in all barrages, irrespective of whether finding of fish reported or not. □ Routing of downstream discharge through fish pass in						

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			the diversion structure, even if fish is not reported.						
2. Silting of reservoirs due to deteriorating catchment leads to their reduced storage capacity / power generation.	☐ Continuous soil erosion in the catchment area.	☐ Reduced power generation. ☐ Reduced life of reservoir. ☐ Ecological imbalance in the catchment.	☐ Develop and implement river basin management plan. ☐ Develop and implement silt management plan. ☐ Promulgation of policies to ensure that all development agencies (including Central) working in the State adopt environmentally benign sustainable technologies. ☐ Develop and promote Green Road technologies. ☐ Develop and seek synergy in Hydro projects. ☐ Implement Catchment Area Treatment plans and EMP. ☐ Monitor implementation of Catchment Area Treatment plans and Environment Management Plan with reference to silt load & composition (Chemical & Physical) including gravity, hardness and shape of particles.	√		√	√	State Compensatory Afforestation Fund Managemnet and Planning Authority	Department of Agriculture, Department of Horticulture, Department of Rural Development, Department of Animal Husbandry, Department of Fisheries, HP PWD, HPSEB, Forum of Hydropower Producers (HPPF) for Satluj & Hydropower Producer Forums of other River Basin(s).

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
3. Catchment area disturbance, e.g., deforestation/removal of vegetation/grazing is leading to soil erosion & siltation of water body/reservoirs & destruction of aquatic fauna/flora.	☐ Continuous deforestation both legal & illegal in the catchment leads to declining forest cover & productivity of forests & adjoining lands. Further, uncontrolled grazing in meadows & pasture land leads to increased pressure on & reduced water holding capacity of forests and other lands. This causes continuous soil erosion & siltation.	☐ Siltation leading to reduction of reservoir/dam/wetland capacity. ☐ Loss of habitat/biodiversity/productivity. ☐ Disturbance to feeding, breeding and nesting of birds including migratory birds.	☐ Monitor construction phase & post project (catchment area treatment plan, silt monitoring plan, watershed development programme) programmes/plans to assess the efficacy of proposed & implemented measures for replications.			√	√	Office of the Chief Secretary.	HPSEB, HPPCL/ SJVNL ZP/PS/GP/LADCs Department of Agriculture Department of Rural Department Department of Animal Husbandry Watershed Development Committees, Department of Fisheries, Department of Forests, HPPCB, DEST, IPH.
4. Depletion of benthic flora & fauna in wetlands/reservoirs/water bodies due to desilting.	☐ Depletion of benthic flora & fauna in wetlands/water bodies/reservoirs due to desilting.	☐ Disturbance to wetland/ecology & food chain. ☐ Disruption of breeding & feeding of fish. ☐ Alteration in water flow. ☐ Decrease in water retention leads to high Total Dissolved Solids/turbidity and decreased oxygen levels, thereby increasing fish mortality.	☐ Prescribe seasonality of the flushing & its monitoring. ☐ Ensure dredge spoils do not re-enter the water body/wetland/reservoir as part of reservoir management plan implementation. ☐ Determine the effect of sediment and silt on benthic		√	√ √		Power Utilities Dept. of Fisheries HP PCB DEST.	DEST, HP SCST, NGOs, Department of Fisheries, CSOs, Zila Parishad/Panchayat Secretaries/Gram Panchayats.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			communities as part of water body/reservoir management & monitoring plan.		√	√	√		
			☐ Identify & implement measures for dredge spoil stabilisation as part of the reservoir/water body/basin management.		√	√	√		
			☐ Maintain adequate depth all the year round as part of reservoir operation plan.						
			☐ Maintenance of Longitudinal Aquatic Connectivity of stream/river.						
			☐ River bed modification between diversion & tailrace outfall in a ROR scheme, so as to derive higher environmental benefits from releasing downstream discharge.						
			☐ Fish pass is a must in all barrages, irrespective of whether finding of fish reported or not.						
			☐ Routing of downstream discharge through fish pass in the diversion						

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			structure, even if fish is not reported.						
5. Change in land use in the catchment and fringe areas/buffer zone, e.g., submergence and promotion of agriculture/horticulture activities leading to adverse impacts on reservoirs/water bodies.	☐ Submergence causes change in land use. Shift in land use & agricultural production patterns in the catchment, buffer zone & fringe areas. It has been reported in Pong wetland report of Forest Department that chemicals, such as CAN, Urea, 12-32-16, DAP, Sulphur Phosphate & insecticides, such as nuvan, etc. pollute water of reservoir and deteriorate flora & fauna.	☐ Eutrophication risks ☐ Potential health risks across the entire food chain. ☐ Fish mortality & decline in productivity. ☐ Rehabilitation & resettlement. ☐ Ecological imbalance due to loss of forest land.	☐ Undertake investigative studies on the impact of insecticidal and fertiliser residue on biotic life of aquatic lotic ecosystems & prioritise water bodies based on the level of concern. ☐ Assist Department of Agriculture & Horticulture Department in formulating action plan in the identified areas based on the level of concern according to investigative studies. ☐ Formulation & implementation of R&R plan in conformity with NRRP-2007, State Guidelines & Standard R&R plan to be made mandatory for all power projects through dedicated, qualified & experienced R&R staff ☐ Strict implementation of (R&R) plans ☐ Implementation of Environment Management Plans.		√	√	√	DEST, Power Utilities	HP- PCB, ZP/PS/GP, Bhakhra Management Board (BBMB), Department of Revenue, Department of Agriculture, Department of Horticulture, Department of Fisheries, DEST, HPSEB, SJVNL / Utilities, Multi-stakeholders Committee of the concerned river basin.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Promote bio-farming, IPN, IPNM, bio-fertiliser, bio-pesticide, etc. ☐ Preparation. of integrated Catchment Are Treatment plan for the entire basin on the pattern of integrated Environment Impact Assessment/Environment Management Plans. ☐ Creation of Basin Catchment Are Treatment plan fund for expeditious implementation of Catchment Are Treatment plans. ☐ Mechanism to be developed for cost sharing on project to project basis, which should be based on proportionate method instead of any limitation of percentage of project cost.						
6. Inadequate enforcement of regulated activities due to involvement of multiple agencies, e.g., operation of reservoir is managed by power utility, forest areas/wetlands come	☐ Lack of coordination between agencies. ☐ Lack of implementation of	☐ Ecological imbalance in aquatic flora & fauna including fisheries. ☐ Loss of wetland/water body/reservoir area due to institutional gaps. ☐ Deterioration of surface	☐ Remote sensing based & other suitable technology based monitoring mechanism to be promoted. ☐ Formulation &		√	√	√	Directorate of Energy/Power Utilities Office of Secretary, Environment	Department of Forest, Department of Agriculture NGO's, CSO's, Department of Tourism, BBMB, SJVNL, HPSEB, ULBs, Department

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
under the jurisdiction of Department of Fisheries, tourism promotion under Department of Tourism, etc.	integrated basin plan.	water quality.	implementation of Reservoir Management & Action Plan □ Formulation. & implementation of dumping area management plans. □ Training of enforcement/regulatory staff & augmentation of enforcement infrastructure.						of Fisheries, Department of Forests & Wildlife, IPH, HPPCB HPPF.
7. Inadequate flow monitoring at each reservoir leads to sub-optimal flow management.	□ Lack of basin planning approach & basin plans.	□ Reduced availability of ecological flow. □ Ecological imbalance.	□ Promotion & adaptation of suitable technology for continuous (24 hour) monitoring, particularly during lean season. □ Development & implementation of river water monitoring plan downstream of dams/reservoirs.			√	DEST	Power	Utilities, BBMB, SJVNL, IPH
8. Hazardous waste generation due to CFL disposal.	□ Lack of collection & disposal mechanism for CFL.	□ Hazardous waste generation. □ Public health risks.	□ Develop & implement extended producer responsibility based collection, transportation & disposal regulation. □ Awareness for general public about the harmful effects of mercury.	√		√	√	HPSEB/DEST, CFL Distribution Companies.	Utilities, ULBs, PRIs, NGOs, CSOs, HPSEB

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
9. Inadequate usage of non-conventional sources of energy.	☐ Lack of awareness. ☐ Lack of mass replications. ☐ Technology constraints.	☐ Impacts due to hydropower development. ☐ Higher emission of air pollutants.	☐ Develop & implement community based decentralised grid programmes/energy programmes using solar & biogas energy for rural areas.			√	√	Himurja	HPSEB, Utilities, Department of Rural Development, PRIs
			☐ Ensure at least 10 % solar/biogas usage in upcoming tourist resorts/hotels while granting EIA clearance to them.	√				State Expert Appraisal Committee Himurja	Himurja, HPSEB, DEST, ULBs, HPPCB.
			☐ Develop awareness programmes for usage of solar & biogas energy in the State.				√	Electricity Regulatory Commission	HPSEB, Utilities, PRIs, ULBs, Department of Rural Development, NGOs/CSOs.
			☐ Make implementation of energy conservation building code mandatory for tourist resorts/commercial establishments, Government buildings	√					Himurja, HPSEB, Utilities, ULBs, Department of Rural Development, Department of Urban Development, NGOs/CSOs.
			☐ Progressive & increased use of energy mix (including non conventional energy) for energy generation & consumption in the State.						
10 Inadequate Bio-energy	☐ Inappropriate	☐ Non utilisation of pine	☐ Review the pine	√	√	√	√	Forest	Power utilities ,

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
utilisation in the State.	pricing of pine needle & lack of collection mechanism.	needles & other biomass including agriculture crop residue leads to forest fires & Green House Gas emissions.	needle collection mechanism & its pricing policy. Develop & implement pine needle collection mechanism involving locals. Engage with & incentivise industrial units to develop & promote pine needles for use as combustible materials.					Department Himurja	Department of Industries.
11Disaster management during construction & operation phases.	Man made failure. Natural calamities. Cavity collapse in underground construction (Tunnel, power house etc.). Oil spillage from transformers, etc.	Flooding. Damage of properties. Loss of lives.	Promotion of a culture of prevention, preparedness & resilience at all levels through knowledge, innovation & education. Undertaking reconstruction as an opportunity to build disaster resilient structures & habitat for ensuring safer living. Preparation of inundation map. Disaster management plan formulation, implementation & periodic checks on preparedness. Integration of		√		√	Power utilities	Himurja, State Disaster Authority, BBMB, SJVNL, IPH, HPPCL.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			project disaster management plan with district or State disaster management plan. □ Preparation of safety, safeguarding plans & their approval by third party. □ Implementation of safety measures & their periodic check.						

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 40. These monitoring requirements should be strictly followed for critically polluted and vulnerable areas.

Monitoring and reporting of pre and post monsoon water spread area and water levels of water bodies/reservoirs. This data should be processed, analysed and published as per forest and wildlife Department norms of reporting and publication at least twice in a year (pre and post monsoon season).

Monitoring and reporting of seasonal (pre and post monsoon) fish species variation and yield. This data should be processed, analysed and published as per forest and wildlife Department norms of reporting and publication at least twice in a year (pre and post monsoon season).

Monitoring of Catchment Area Treatment (CAT) plans and documenting, reporting and publishing on an annual basis using remote sensing and Geographical Information Syaytem applications should be carried out.

Monitoring and Reporting of cases of encroachments in the fish spawning, breeding and feeding area through inter-Department / inter agency coordination and identification of areas prone to encroachment should be done. This data should be documented, reported and published annually.

Seasonal (pre and post monsoon) water quality monitoring of major fisheries reservoirs / wetlands / water bodies, their analysis and reporting to establish trend should be carried out. This data should be documented, reported and published annually.

Monitoring of river flow downstream of hydropower electric project: Daily, monthly and yearly monitoring of river flow data should be carried out. This data should be documented, reported and published annually.

Monitoring and reporting of desilting / dredging operations (silt load / dredged material / area/silt disposals) of wetland / dam / reservoir critical to fisheries by management agency. This data should be documented, reported and published annually.

Monitoring of awareness campaign: Annual tracking of awareness programmes / campaigns needs to be carried out. The areas include industrial effluents, degradation of fish species, degradation of water quality, use of pesticides, depletion of wetland/water body/reservoir flora and fauna, unrestricted dumping of sewage solid waste and toxic chemicals, deforestation. Conduct annual surveys to find the effectiveness of the different campaigns and reformulate the communication strategy of the awareness programmes.

All the above have to be documented and reported to the relevant Departments on quarterly basis. Also, the remedial measures taken to combat the situation have to be documented.

Table 40: Performance Indicators

Outcomes	Indicators
1. Improvement of water quality. Desiltation for removal of organic/toxic sediments.	Meeting at least designated Best Use Class D for surface waters as given by Central Pollution Control Board. Percentage reduction of silt load. Percentage reduction of dredged material. Percentage reduction in volume of silt disposal.
2. Catchment treatment to check erosion.	Percentage of area treated under CAT plan each year.
3. Conservation of wetlands/reservoirs/ water bodies, flora and fauna. Conservation of water spread area.	**i. For species** a. Quantity: Percentage decrease/increase in size of population present; Percentage increase/decrease in total population at a specified point in an annual cycle; Percentage increase/decrease in the extent or distribution of a population Number and location of check points in the catchment. **ii. For habitats** a. Quantity: Percentage increase or decrease in the area occupied by the habitat. Percentage increase or decrease in the number of wetlands/reservoirs/water bodies. Percentage increase or decrease in the depth of water. b. Quality: Percentage increase or decrease in the population of threatened species/individuals/or groups of species.
4. Degree of local participation in wetland/reservoir/water body management.	Number of wetland/reservoir/water body management committees formed. Number of issues raised related to fisheries. Number of issues documented by the wetland management committee.
5. Flow monitoring.	Daily, monthly & yearly monitoring of river flow data downstream of dam/reservoir.
6. Energy Conservation.	CFL penetration every year. Transmission and distribution losses.
7. Non-renewable energy usage.	Number of solar heating/cooker penetration/usage every year. Number of wind energy/conversion of biomass into energy projects developed & implemented. Number of solar street lights. Number of domestic solar lights. Percentage/number of units (industrial/commercial/residential) switching from conventional energy sources to non conventional energy sources. Savings in energy (MWh/KWh) accruing from switch to non conventional sources.
8. Encroachments.	Percentage increase/decrease in number of reported cases of encroachment in the fish

Outcomes	Indicators
	spawning/feeding/breeding areas. Percentage increase/decrease in number of eviction wetland/reservoir/water body clearances.
9. Scientific management of wetland/reservoir/water body.	Number of wetlands/reservoirs/water bodies proposed for wetland management plan development & implementation.
10. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New & effective enforcement mechanisms in force.
11. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers & staff of Department of fisheries, tourism, forest & wildlife, PRIs & other line agencies. Creation of data bank at coordinating agency & regular publication on State Government websites on the state of wetland, water, air & waste scenario & its implications.

5.8 Market Infrastructure

Proposed actions to address specific Market Infrastructure issues and type of response have been identified and described in Table 41. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 41 clearly delineates these agencies.

Table 41: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Inadequate use of system approach in agriculture/horticulture marketing practices leading to spoilage/wastage.	▯ Inadequate market information ▯ Inadequate transportation & collection facilities ▯ Expensive transportation	▯ Loss/wastage of produce and increased pollution ▯ Deterioration in quality of produce ▯ Input resource loss, e.g., fertilisers, soil nutrients, water	▯ Develop & implement IT interventions in agriculture/horticulture produce collection, transportation, storage & selling.			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PRIs Department of Industries.
			▯ Develop & implement state level APMC market information system & integrate it with national/international system.			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PRIs Department of Industries.
			▯ Maintain & manage product logistic system based on market information/intelligence ▯ Identify decentralised waste treatment opportunities, particularly for predominantly organic waste including options of composting/vermi-composting in suitable climatic conditions ▯ *Mandis* could be			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PRIs Department of Industries.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			developed as outlets for selling compost						
2. Inadequate market infrastructure & access to markets leading to spoilage and wastage of products.	☐ Inadequate marketing infrastructure facilities. ☐ Inadequate marketing information. ☐ Inadequate transportation & collection facilities. ☐ Difficulty in transportation of agricultural products due to difficult terrain. ☐ High cost of surface transport of produce to the consuming markets. ☐ Poor communication network due to hostile terrain.	☐ Wastage of produce. ☐ Reduction in economy. ☐ Deterioration in the quality of produce. ☐ Remunerative prices for their farm produce ☐ Develop & implement efficient and conducive transport facility with Private Sector participation.	☐ Develop market infrastructure in line with national benchmark.			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PRIs, Municipalities.
			☐ Renovate & upgrade existing market infrastructure to minimise spoilage & wastage.			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, Municipalities, IPH Department of Industries.
			☐ Develop & implement efficient & conducive transportation plan with Private Sector participation.			√	√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PWD, Department of Transport.
3. Inadequate market infrastructure due to shift in cropping patterns because of market-driven forces & climate change.	☐ Major shift is from cereal crops to vegetable crops ☐ Changes in provision of irrigation system. ☐ More demand for traditional mixed cropping and mixed	☐ Unsustainable farming ☐ Challenging to sustain farm income & achieving self sufficiency. ☐ Declining	☐ Identify & access long term infrastructure needs in view of crop diversification & shift in cropping pattern for the next twenty years.			√	HPMC	Department	of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PWD,

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	farming. Due to environmental changes.	traditional cropping practices & animal husbandry. Long term repercussion on farm income & employment & farm based livelihoods.							Department of Transport.
			Develop & implement business and action plans including financing requirements.				√	HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PWD, Department of Transport.
			Implement action plan with Private Sector participation.			√		HPMC	Department of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PWD, Department of Transport.
4. Inadequate packing and packaging mechanisms leading to spoilage and wastage of products.	Air flow rates around the commodity. Temperature & relative humidity. Use of bad quality packaging .accessories, such as trays, cups, wraps, etc. Use of corrugated fibreboard containers. Non-organic sterile material are not used.	No maintenance of the quality & safety of crops. Damage to or deterioration of the goods' quality. Reduction in economy.	Develop & implement upgradation plan for packing & packaging mechanisms in line with international standards.		√	√		HPMC	Department of Agriculture, Department of Horticulture, Department Rural Development, Telecom Service Providers, PWD, Department of Transport, NGOs, CSOs.
			Promote reuse & recycling of disposed packing material. Develop suitable strategies & alternatives of packaging materials made of plastics.		√	√	HPMC	Department	of Agriculture, Department of Horticulture, Department of Rural Development, Telecom Service Providers, PWD,

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Identification & adoption of good practices to reduce/eliminate waste generation.						Department of Transport, NGOs, CSOs.
5. Inadequate storage and warehousing infrastructure near production areas and in markets leading to spoilage & wastage of products.	☐ Inadequate equipment facility. ☐ Inadequate post harvest storage & processing facilities . ☐ Improper packaging. ☐ High moisture content. ☐ Frequently inadequate knowledge of methods to care for the food properly. ☐ Losses in processing & handling. ☐ Freezing injury. ☐ Chilling injury.	☐ Inadequate stock for future requirements. ☐ Inadequate yields. ☐ Reduction in economy. ☐ Impacts on quality & quantity. ☐ No assurance of proper air circulation.	☐ Accelerate/initiate actions for renovation/ upgradation envisaged in project implementation plan for management of existing storage facilities.			√	√	HPMC	Infrastructure Developers/ Operators/ NCDC/PRIs, Department of Horticulture, Department of Agriculture.
			☐ Develop & implement storage infrastructure development plan based on market research & operations management study envisaged for agriculture/ horticulture.			√	√	HPMC	Infrastructure Developers/ Operators/ NCDC/PRIs, Department of Horticulture, Department of Agriculture.
			☐ Develop and implement aviation infrastructure development plan in the States as an alternative to road infrastructure.			√	√	Department of Aviation/NHAI	Department of Agriculture, Department of Horticulture, Department of Tourism, Infrastructure Developers, PRIs.
			☐ Integrate operations of storage & warehousing infrastructure with logistics management through automated online system.			√	√	HPMC	Infrastructure Developers/IT/ Telecom Service Providers, Department of Agriculture, Department of Horticulture,

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
									Operators/ NGOs.
			☐ Develop & implement waste management system at storage areas.			√	√	HPMC	Infrastructure Developers/ Operators/ NGOs/ULBs, Department of Agriculture, Department of Horticulture. Department of Health Department of Ayush State Medicinal Plants Board Department of Forests R&D Institutes Universities
			☐ Promote processing & value addition by undertaking Research & Development & adopting good practices.				√	R&D Institutes & Universities	
			☐ Promote marketing of medicinal plants & NTFP.				√	Himachal State Ariculture Marketing Board.	
6. Wastage, spoilage & loss of products due to inadequate road infrastructure & maintenance leading to its delayed transportation to the markets.	☐ Bad conditions of roads. ☐ Inadequacy of facilities. ☐ Potholes on the roads and landslips. ☐ Irresponsible driving. ☐ Overloading of mixed fruits & vegetables. ☐ Unsuitable transport containers. ☐ Virtual absence of refrigerated. & insulated trucks ☐ Delays in product procurement after harvesting or at collection centres.	☐ Wastage of time. ☐ Road accidents. ☐ Loss of fruits due to temperature mismanagement. ☐ Impacts on economy. ☐ Can't fulfil market requirements on time. ☐ Enable proper air circulation in fruits & vegetables .	☐ Promote plans/programmes for maintenance of all weather State Highways/arterial roads.			√	√	Public Works Department (PWD).	Department of Agriculture/ Horticulture, Department of Transportation, HPMC.
			☐ Promote development of alternate road infrastructure as per infrastructure development plan under Public Private Partnership.			√		Public Works Department (PWD).	Department of Agriculture/ Horticulture, Department of Transportation, HPMC.
			☐ Develop parking & storage infrastructure at transit points on major routes.			√	Himachal Road Transport Corporation, Shimla		PWD, Department of Agriculture/ Horticulture, ULBs, PRIs, DEST.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Monitor the performance of air quality.			√		Himachal Road Transport Corporation, Shimla.	Department of Agriculture/ Horticulture, Department of Transportation, HPMC.
			☐ Undertake Research & Development to reduce/eliminate post harvesting losses.				√		Universities R&D Institutions focusing on Agriculture & Horticulture.
			☐ Identify & adopt good practices in reducing the post harvesting losses.				√		
7. Inadequate sewage & solid waste management infrastructure at markets leading to increase in public health risks.	☐ Uncollected solid waste. ☐ Leakage from landfills. ☐ No proper waste disposal method. ☐ Impropermanagement of disposal. ☐ Plastic waste. ☐ Inefficient infrastructure.	☐ Health risks. ☐ Skin & blood infections. ☐ Eye & respiratory infections. ☐ Bone & muscle disorder. ☐ Chronic respiratory disease. ☐ Wet waste decomposes & releases bad odour & leads to unhygienic conditions. ☐ Unattended waste lying around attracts disease causing creatures.	☐ Prepare & implement APMC solid waste collection, segregation & disposal management plan.			√	√	APMC/Market Association.	HPMCC/ULBs, PRIs, IPH, Department of Agriculture, Department of Horticulture
			☐ Since APMC waste is rich in organic content, develop vermi composting/organic compost plan to dispose APMC solid waste. This compost can be sold at the outlets in APMC market.			√	√	APMC/Market Association.	HPMC/ULBs, PRIs, IPH, Department of Agriculture, Department of Horticulture.
			☐ Prepare & implement APMC sewage collection & disposal management plan.			√	√	APMC/Market Association.	HPMC/ULBs, PRIs, IPH, Department of Agriculture, Department of Horticulture
			☐ Implement occupational health & safety (OHS) management system.				√	Department of Labour	Department of Health & Family Welfare, DEST.

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Promote awareness programmes on health safety.			√	√	Department of Health	Department of Agriculture, Department of Horticulture, Government & Private Institutes/NGOs /CSOs.
8. Inadequate use of systematic market survey & planning in agriculture & horticulture sector at State level leading to inadequate market infrastructure planning & operation.	☐ Inadequate integrated handling system to manage the product. ☐ Inadequate storages, grading and packing facilities. ☐ High transportation costs. ☐ Insufficient infrastructure. ☐ Inadequate finance, shortage of skilled labour. ☐ Improper storage, drying, grading practices at farm level. ☐ Inadequacy of processing/storage facilities/orchard management. ☐ Absence of cold storages.	☐ Product loss/wastage. ☐ Loss of revenue. ☐ Impacts on frequent deliveries of harvested fruits. ☐ Input resource loss.	☐ Commission a market research study for identifying new markets both in country & aboard in view of product diversification & differentiation for the next ten/twenty & thirty years. ☐ Identify market infrastructure needs to support new/ existing markets. ☐ Implement and operationalise both product marketing & infrastructure development plans.		√		√	HPMC	Department of Horticulture/ Agriculture, Department of Rural Development, PRIs, NGOs/ CSOs.
9. Indiscriminate Use of chemicals leading to over ripening/spoilage & wastage of agriculture/horticulture produce and increased public health risks.	☐ Excessive usage of chemicals for enhancing the production rate. ☐ Usage of sub standard chemicals.	☐ Health risks to consumers/farmers. ☐ Toxic products. ☐ Early mortality.	☐ Accelerate/Initiate action plan/programme at State level for implementation of control methods, such as biological, chemical & cultural.		√	√	√	Department of Agriculture / Department of Horticulture.	HPAMC/CSOs/ NGOs/PRIs, Department of Rural Development

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Design & Initiate programmes/projects for promoting organic farming products.			√	√	HPMC	Department of Agriculture /Horticulture, Department of Rural Developmen
			☐ Strictly implement disease quarantine measures in APMC market.			√	√	HPMC	Department of Horticulture/ Agriculture, Department of Rural Development, PRIs, NGOs/ CSOs,
10. Inadequate awareness & usage of ICT tools.	☐ Limited reach & extent of public awareness campaigns due to topography/hilly terrain. ☐ Inadequate NGO/CSO participation. ☐ Inadequate awareness about technologies. ☐ Credit instruments & crop insurance need tobemadefarmer-friendly. ☐ Inadequate transfer of technology through front line training. ☐ Inadequate training through on-farm trials.	☐ Product wastage/loss ☐ Low yield. ☐ High raw material input cost. ☐ Inadequate. infrastructure development knowledge.	☐ Develop & promote awareness programmes for using market information/intelligence. ☐ Develop & implement training programmes for ICT penetration & usage among farmers. ☐ Develop & implement a programme of *Kisan* Kiosks at *Panchayat* office where ICT infrastructure can be operationalised.			√	√	Department of Horticulture/ Department of Agriculture.	Department of Rural Development, Telecom Service Providers/ Government & Private Institutes/NGOs /CSOs, PRIs, HPMC.

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below. These monitoring requirements should be strictly followed for critically polluted and vulnerable areas.

Monitoring of input and output material /product in APMC market: Input and output of material / product traded in APMC market should be monitored, documented, published daily, monthly and yearly.

Monitoring of product-wise wastage/spoilage at APMC market: Daily, monthly and yearly monitoring of product-wise wastage/spoilage at APMC market area should be carried out. This data should be documented, reported, and published monthly and annually.

Monitoring of product-wise wastage/spoilage at warehouse/storage facility: Daily, monthly and yearly monitoring of product-wise wastage/spoilage at warehouse/storage area should be carried out. This data should be documented, reported, and published annually.

Monitoring of arrival and departure of number of trucks/vehicles in APMC market: Number of trucks arriving in and departing from APMC market should be monitored, documented and published on daily, monthly and yearly basis.

Ambient Air Quality Monitoring: The existing Ambient Air Quality (AAQ) status should be monitored in and around APMC market. Methodologies adopted for sampling and analysis are as per the approved methods prescribed by the Central Pollution Control Board (CPCB). This data should be documented, reported and published quarterly.

Monitoring of APMC solid waste generation, collection and disposal: The parameters which should be monitored are such as: Types of waste, Density of waste, Waste collection frequency and treatment. This data should be documented, reported, and published monthly and annually.

Water quality monitoring and reporting: Collect the data both for surface and groundwater (district wise) and analyse the trends and levels of contamination. This should be carried out at the source and at household levels. This data should be processed, analysed and published quarterly. The water quality parameters should be tested as per IS 10,500.

Creation of common platform for inter-Departmental coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Monitoring and reporting of disease: Regular inspections should be carried out on plants and data related to work place diseases should be recorded, documented and published every year.

Awareness programmes to be conducted: Annual tracking of awareness programmes / campaigns needs to be carried out. The areas include farming technologies, storage and marketing facilities, health of farmers, use of bio pesticides etc.

Daily update of State Government's website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on market infrastructure environment in the State

Performance Indicators: For macro-level management of market infrastructure related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 42 will have to be monitored and reported by the concerned coordinating agency/Department.

Table 42: Performance Indicators

Outcomes	Indicators
1. Implementation of measures to control spoilage/wastage of produce.	Reduced/increased percentage of spoilage/wastage every month from each of the APMC market. Number of decentralised composting/vermi-composting projects at *Mandi* level.
2. Implementation of pollution control measures at APMC market/other markets.	Reduced/increased percentage of Muncipal Solid Waste generation, collection & disposal. Reduced/increased percentage of sewage generation, collection & disposal. Reduced/increased values of parameters of ambient air quality vs. standards at APMC market. Regular monitoring of water supply. Number of programmes or projects.
3. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers & staff of line & associated Departments. Creation of data bank at coordinating agency & its regular publication on State Government website.
4. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New & effective enforcement mechanisms in force.

5.9 Rural Planning

Proposed actions to address specific sector specific issues and type of response has been identified and described in Table 43. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response require identification of coordinating and collaborating agencies. Table 43 clearly delineates these agencies.

Table 43: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
1. Inadequacy & lack of environmental mainstreaming in development planning of rural areas .	☐ Socially acceptable & gainful employment opportunities are not adequately & equitably available. ☐ Planning strategies of Himachal Pradesh are based mostly on the lines followed by the Central Government.	☐ Migration to urban areas, especially of youth. ☐ Increased urbanisation and growth of slum areas. ☐ Stress on basic amenities & inequitable access to basic amenities & resources. ☐ Alienation & deepening of social Incohesiveness.	☐ Extend Sectoral Decentralised Planning (SDP) to Tribal & Backward Areas of Himachal Pradesh with environmental mainstreaming as per decision of the Government. ☐ Integrate planning principles of inclusive development in all rural development planning & State Government programmes/schemes with environmental mainstreaming as per decision of the Government. ☐ Generate employment opportunities by ensuring better coordination among Government, CSOs & Private Sector by promoting investment & improving marketable vocational skills, especially in clean technologies.		√	√	√	Department of Planning	Department of Rural Development (RD), *Zila Parishad* (ZP), *Gram Panchayat* (GP), *Panchayat Samiti* (PS), Public Works Department (PWD), Irrigation & Public Health (I&PH), State Housing Board and other sectoral Departments implementing the capital components in respective budgets as Employment. Generation.
2. Decreasing farm productivity (including agriculture, horticulture, animal	☐ About 10% of the total land area is cultivated. High population pressure	☐ Deterioration of livelihoods/loss of livelihoods of 84.5% of small & marginal farmers in the State.	☐ Implement agricultural & allied sector reforms in the State. ☐ Strengthen implementation of					Department of Planning	Department of Rural Development (RD) *Zila Parishad* (ZP) *Gram Panchayat* (GP) *Panchayat Samiti* (PS)

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
husbandry, fisheries & related sectors,etc.) with increasing population.	on cultivated land. Small land holdings of most of the cultivators. □ About 20% of the cultivated area is under irrigation & remaining 80% is rain-fed.	□ Abandoning of farming & increasing migration from rural areas.	Integrated Watershed Management Plan (IWMP) & MNREGAfocusing on agriculture production. □ Develop & implement crop and horticulture diversification plans, programmes & projects including herbs & medicinal plantations & floriculture. □ Implement backward & forward linkages to farm & horticulture sector to increase resource conservation & reduce waste generation.		√	√	√		13 Sectors/Deptt. with development budget heads (as given in the footnote
3 Inadequate rural infrastructure planning & implementation from environmental perspective.	□ Remoteness & inaccessibility. □ Gaps in demand and supply. □ Increased population pressure.	□ High cost of development & maintenance of infrastructure . □ High transportation costs because of inadequate road network. □ Poor quality of the	□ Prioritise future infrastructure investment for creating rural infrastructure & improve management practices of existing infrastructure planning by mainstreaming environmental safeguards at every level, e.g., State, district, block & *Panchayat*. □ Maintain & upgrade existing		√	√	√	Deptt. Planning	Himachal Pradesh Infrastructure Development Board Himachal Pradesh Road & Other Infrastructure Development Corporation Limited Department of Rural Development (RD)

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
		infrastructure.	rural infrastructure including transport, power, rural water supply & sanitation with mainstreamed environmental safeguards. Strengthen industrial units in all districts & backward pockets as per the Revised Backward Area Industrial Policy with environmental safeguards.						*Zila Parishad* (ZP) *Gram Panchayat* (GP) *Panchayat Samiti* (PS) 13 Sectors/Departments with development budget heads (as given in the footnote
4 Inadequate education & health facilities.	Inadequate & poor quality service delivery of education & health. Inadequate physical infrastructure for providing health & education needs of the rural population.	Human Development potential may not be fully realised.	Expand health facilities with increased health & infrastructure development in rural areas with bio-medical waste management. Expand environmental education facilities & infrastructure in rural areas in the State, e.g., IEC activities under Total Sanitation Campaign, watershed development programmes, MGNREGA, etc., which link to increased health infrastructure & increased environmental awareness. Enhance labour awareness & capacity by investing in		√	√	√	Department Planning	Department of Rural Development (RD) *Zila Parishad* (ZP) *Gram Panchayat* (GP) *Panchayat Samiti* (PS) Department of Elementary Education Department of Health and Family Welfare 13 Sectors/Departments with development budget heads (as given in the footnote

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
			health & environmental education, programmes & projects.						
5. Inadequate institutional finance & credit flows (including micro finance) for environmentally sustainable economic activities.	☐ Inadequate institutional finance. ☐ Inadequate numbers & skills of SHGs, Mahila Mandals & other Community based Organisations.	☐ Potential of microfinance in rural development may not be fully realised.	☐ Promote & strengthen institutional finance for financing long term rural environmental infrastructure development programmes & projects. ☐ Promote Microfinance Institutions for financing village level water supply/sanitation & clean technologies projects.		√	√	√	Department Planning NABARD and other Banking Institutions	Department of Planning NABARD and other Banking Institutions
6. Inadequate skills among rural population.	☐ Inadequate number of rural Institutions for developing skills. ☐ Inadequate opportunities to build skills of rural population. ☐ Inadequate livelihood diversification options & opportunities.	☐ Full potential of skills of rural population may not be realised.	☐ Promote bio-technology for generating employment in the field of agriculture & horticulture. ☐ Provision of income generating assets aimed at encouraging small scale & cottage industries & providing gainful employment opportunities through backward & forward linkages. ☐ Develop & foster coordination among *Panchayats*, Government and CSOs for		√	√	√	Department of Planning	All line Departments implementing development programmes and schemes. Micro, Small and Medium Enterprises Development Institute.

Issues	Causes	Impacts/Risks	Proposed Actions	Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			upgradation of skills Promote rural enterprise catering to skills & needs of rural populace.						
7. Inadequate capacity of Institutions, like *Panchayat*, Cooperatives and others for planning & implementation of rural development programmes.	Inadequate financial investment in developing the capacity of the *Panchayats*, Cooperatives etc Inadequate technical & administrative & micro-planning skills.	Poor micro planning. Inadequate technical & administrative & micro-planning skills.	Preparation of Model Guidelines/Manuals to facilitate the preparation of the best Micro Plans with environmental mainstreaming by the *Panchayats*. Constitution of core group of experts for monitoring & advocacy regarding Micro Planning mainstreamed with environmental safeguards. Enable & empower Water Users/PRIs & stakeholders to plan, implement & manage the drinking water & minor irrigation systems Promote joint training of Government officials working with PRIs. Promote & facilitate Intra-state exposure visits to places where successful models of		√	√	√	Department of *Panchayati Raj*	

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
			rural development programmes with environmental mainstreaming have been demonstrated. □ Study/Exposure visits of core group members & selected office bearers of *Gram Panchayats* outside the State & within the State. □ Organise *Panchayat Sammelans* with environment as theme at regular intervals. □ Promote & facilitate network of elected women representatives, CBOs & *Mahila Mandals* for undertaking environmental projects.						
8. Inadequate social cohesion leading to unequal participation in rural development .	□ Lack of inclusive development. □ Inadequate representation/inclusion of marginalised sections of the society in the development programmes, schemes, projects.	□ Increased vulnerability of the marginalised sections of the society. □ Alienation of marginalised sections of the society.	□ Empower families & broaden the below the poverty line by enlarging the scope of the rural development programmes for poverty alleviation and welfare of women, the Scheduled Castes & Scheduled Tribes. □ Empower Women, SC/ST by imparting new skills/capacity		√	√	√	Department of Planning	Himachal Pradesh State SC/ST Corporation, Backward Classes Finance and Development Corporation, Social Women Development Corporation,

Issues	Causes	Impacts/Risks	Proposed Actions	Response				Coordinating Agencies	Collaborating Agencies
				Policy	Plan	Programme	Project		
			enhancement, especially in clean technologies to end exclusion.						Minorities Finance and Development Corporation, Department of Social Justice and Empowerment.

**13 Sectors/Departments with development budget heads are:*
(a) Agriculture, (b) Soil Conservation (Agriculture), (c) Horticulture, (d) Minor Irrigation, (e) Animal Husbandry, (f) Social Forestry,
(g) Village and Small Scale Industries, (h) Rural Roads under Roads and Bridges, (i) Elementary Education, (j) General Education other than University Education, (k) Rural Health (Allopathy), (l) Ayurveda, (m) Rural Water Supply.

Monitoring and Reporting

Any plan is as good as it is implemented. Monitoring is an effective tool for planning and implementation. Therefore, strengthening of existing monitoring system has to be undertaken all through the line to facilitate timely corrective measures.

Table 44: Performance Indicators

Outcomes	
1. Employment generation under the Mahatma Gandhi National Rural Employment Guarantee Act.	Number of job cards issued. Percent increase in employments generated. Wages given in cash. Percent reduction in rural migration. Types/sustainability of assets created.
2. All other CSS & other State sponsored programmes/schemes.	Total beneficiaries assisted. SC beneficiaries assisted vs total assisted beneficiaries. ST beneficiaries assisted vs total assisted beneficiaries. Women beneficiaries assisted vs total assisted beneficiaries. Disabled beneficiaries assisted vs total assisted beneficiaries. Backward classes beneficiaries assisted vs total assisted beneficiaries. Reduction in rural migration.
3. Mahila Mandals (MMs)/Self Help Groups (SHGs).	Number of MMs/SHGs formed under various programmes/ schemes. Number & type of income generating activities. Value of loans given to members. Repayment of loans by members. Total savings in the bank account of MMs/SHGs. Number of SHGs working on water supply, sanitation & health interventions. Number of SHGs working on medicinal, herbal products. Number of SHGs working on value added products, e.g., organic farm/non-farm based products.
4. Distribution of waste land to the landless.	Total land distribution(ha)/ Land distributed to SC (ha)/ Land distributed to ST (ha)/ Land distributed to Others (ha).
5. Increased productivity in agriculture & allied sectors.	Quantum of on-farm/off-farm produce (grain/non grain per unit area/livestock/fish.
6. Basic rural infrastructure including health & services.	Increased access to basic services. Increased literacy levels among both males & females. Decline in instances of Maternal Mortality Rate and Infant Mortality Rate in rural areas. Decline in instances of vector borne diseases.
7. Minimum Wages Enforcement (including Farm Labour).	Agriculture & farm workers. Inspection made. Irregularities detected.

Outcomes	Indicators
	Irregularities rectified. Claims filed. Claims settled. Prosecution cases pending. Prosecution cases filed. Prosecution cases decided.
8. Increased capacity of PRIs/Cooperatives/CBOs.	Powers, functions & responsibilities entrusted to PRIs is implemented per Department (as given in the manual vide notification No. PCH-HA(1)12/87-10206-406 Dated Shimla-2, July 31, 1996). Improvement in contributions to micro planning & district plans.
9. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New & effective enforcement mechanisms in force. Number of good practices documented & published including uploads on concerned line Department's website.
10. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers & staff of PRIs. Creation of data base at coordinating agency level/line Department level & regular publications on State Government websites on the status of implementation of various development programmes & schemes.

5.10 Urban Planning

Proposed actions to address sector specific issues and type of response has been identified and described in Table 45. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 45 clearly delineates these agencies.

Table 45: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
Inadequate Water Supply.	☐ Increase in urban population. ☐ Migration from rural to urban areas. ☐ Increasing gaps between demand & supply. ☐ Remoteness & inaccessibility of habitation. ☐ Scanty & uneven distribution of rainfall. ☐ Siltation of water bodies.	☐ Increased pressure on existing water resources.	☐ Identification of potential schemes including water Harvesting. ☐ Beneficiary mapping & identification. ☐ Ensuring availability of water equitably. ☐ Make Rain Water Harvesting StructureS mandatory in all commercial & residential areas, new buildings & townships.				√	IPH	Department of Planning Department of Urban Development Town & Country Planning ULBs *Zila Parishad* (ZP)
Inadequate Sewerage System.	☐ Inadequate Sewerage network coverage (between new & old city/towns. ☐ Poor sanitary conditions in towns/wards, which are not covered by sewerage networks. ☐ Inadequate/improper treatment & disposal	☐ Pollution of water resources from disposal of untreated sewage.	☐ Identification of areas not connected to current sewerage networks. ☐ Identify new sewerage schemes to bring the uncovered areas under new sewerage network. ☐ Develop integrated				√	IPH/ULB	HP PCB, DEST

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	of sewage.		water supply & sewerage projects. Prevention & control of water pollution. Make waste water treatment & recycling mandatory in new buildings & townships.						
Inadequate Solid Waste Management.	Poor sanitary conditions in towns/wards, which are not covered by SWM services.	Increased instances of outbreak of diseases like diarrhoea and malaria, etc. due to indiscriminate dumping & improper disposal of solid waste, for instance, incineration.	Identify suitable sites in the Master Plan for Muncipal Solid Waste Treatment & Disposal facility location, keeping in mind the hilly conditions. Adopt regional approach in the development of Muncipal Solid Waste Treatment & Disposal facility. Attempt setting up decentralised Muncipal Solid Waste Treatment & Disposal facility.				√	Department of Urban Development Town & Country Planning ULBs	Department of Planning .
Inadequate Energy Efficient measures & practices in building design & construction.	Use of wood/fuel in heating of buildings (residential/commercial). Understanding of	Increased energy demand.	Increased awareness on Energy Conservation Building Code.			√	√	Department of Urban Development Town &	Directorate of Energy HIMURJA

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	ECBC is limited. □ Because of voluntary nature of ECBC adoption and implementation, its implementation pace is tardy in Himachal Pradesh. □ Understanding of new & renewable energy sources is limited. □ High cost of setting up & operating appliances & equipments run on new & renewable energy sources.		□ Mandatory implementation of Energy Conservation Building Code in all Government & commercial buildings. □ Provide parking space as per Equivalent Car Space factoring in hill conditions in all new buildings & township projects. □ Provide green areas and open spaces as per norms factoring in hill conditions in all new buildings and township projects, □ Make mandatory provisions for use of new & renewable sources in street lighting & passive solar architectural features in plan layout .					Country Planning	Department of Planning
Inadequate Energy Efficient measures & practices in transport sector.	□ Dependence on road transport in the urban & transport planning in view of the hilly	□ Inclusive growth may not be achieved as inadequate interventions for	□ Develop urban transport in line with policies, such as National Urban Housing & Habitat			√	√	Department of Transport	Department of Planning Department of Urban

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	terrain. Limited options alternate modes of transport. High cost of fuels in remote & inaccessible areas in HP due to high transportation cost. Preference for diesel in transport sector.	improvement of public & non-motorised transport will make the services inaccessible to the poorer sections of society, the major users of these modes. It will also decrease productivity (due to increased congestion) & poor safety on the road. Increased use of rail freight, non-motorised and public transport modes and introduction of cleaner vehicles and fuels may contribute greatly to air pollution. Energy Security may be jeopardised because of increased fuel consumption. Non Conformity to the emission standards.	Policy to ensure that cities remain dense & of mixed land-use with adequate provisions for housing for the poor to ensure that their travel distances remain small. Develop urban planning guidelines to encourage transit-oriented development. Discourage sprawl, rationalise parking policies & charges, & mandate public transport accessibility indicators for large developments. Institute intelligent transport systems to enable schemes, such as congestion charging. Improving vehicle efficiency. Shifting freight						Development Town & Country Planning *Zila Parishad*

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			transport from road to railways & waterways & alternate modes of transport. □ Shifting passenger transport to public transport. □ Shifting vehicles to electric & hybrid varieties. □ Greater penetration of biodiesel. □ Earmark buffer zones along the National/State Highways/MDRS, where no construction activity is allowed to curb ribbon development. □ Consider freezing of land use along the National & State Highways to curb the vicious trend of ribbon development & urban corridors. □ Extend the Town &	√				TCP	Department of Planning Department of Urban Development

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			Country Planning Act, 1977, to include 25-30 metre wide strips along the National & State Highways (on both sides) to combat ribbon development.						
Lack of equity in provision of services.	Inadequate focus on planning basic services for urban poor.	Continued alienation of urban poor & inaccessibility & high cost of accessibility to the basic urban services for the poor.	List vacant & under-utilised lands. Prepare an updated list of vacant lands including Government & private land, land notified for acquisition. Mark vacant land pockets on the map & assess the area available. Examine the land use assigned to vacant pockets in the master Plan. Identify under-utilised Government lands & lands proposed for redevelopment. Identify lands proposed for future residential development.			√	√	Department of Planning Department of Revenue	TCP, UD Department, ULBs, IPH, Department, ULBs, Transport Department, Directorate of Energy, Himachal Pradesh-PWD Himachal Pradesh State Land Use & Wasteland Development Board .

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Assess land that would become available after enforcement of the pro-poor reforms. ☐ Reservation of 20-25% of developed land for EWS/LIG housing in every new public/private residential development. ☐ Assess land acquisition costs, land development costs & construction costs & market price of land. ☐ Examine the current land assembly mechanisms & policy obstacles to land supply. ☐ Establish a system of redressal for continued alienation of land by the State Government to the ULBs to ensure continuous supply of developed land for EWS/LIG housing.						

Issues	Causes	Impacts/Risks	Proposed Actions	Response					
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			☐ Identify land ownership status of vacant pockets. ☐ Ensure availability of sites for housing the poor. ☐ Creation of land pool for housing the poor. ☐ Timely construction of houses. ☐ Provide bank Loans to the beneficiaries. ☐ Provide security of tenure to every beneficiary. ☐ Provide access to infrastructure services at affordable rates.						

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 46. These monitoring requirements should be strictly followed for urban planning. Monthly monitoring of development of Infrastructure projects, which provide basic urban services infrastructure.

Daily update of State Government's website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on Urban Environment.

Performance Indicators: For macro-level management of urban planning related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 46 will have to be monitored and reported by the concerned coordinating agencies/Departments.

Table 46: Performance Indicators

Outcomes	Indicators
1. Improved water supply & equitable accessibility.	Number and/or percentage of households having individual connection. Number and/or percentage of urban poor having individual connection or at community level. Number and/or percentage of households & commercial establishments setting RWHS.
2. Improved sewerage connection.	Number and/or percentage of households having individual connection. Number and/or percentage of urban poor having individual connection or at community level. Number and/or percentage households having individual toilet unit (with toilet seats). Number and/or percentage of urban poor having individual toilet unit at community level. Number and/or percentage of households & commercial establishments practicing recycling of water & using treated waste water.
3 Improved Solid Waste Management (by collection treatment & disposal of solid waste by the Municipality).	Periodicity of removal of MSW (Every day/alternate). Number of new/improved MSW treatment & disposal facilities. Number of regional & decentralised MSW treatment & disposal facilities.
4. Improved access to roads.	Length of new road developed for improving access. Width of the road/accessibility from the nearest road head.
5. Energy efficient public buildings.	Number and/or percentage of new buildings following ECBC. Notification & schedule of phasing out of heating by wood & other fuels in residential & commercial establishments in old buildings & townships. Number and/or % of households & commercial establishments phasing out heating by wood & other fuels. Adoption of Green Building Rating System.

Outcomes	Indicators
	Notification on mandatory use of new & renewable sources of energy in new buildings & townships in both residential & commercial establishments. Number and/or percentage of households & commercial establishments adopting appliances & devices for using new & renewable sources of energy.
6. Efficient transportation system	Diversity in types of fuels in use. Stages of phasing out old fleet of buses/switch to cleaner fuels. Number and/or percentage of vehicles conforming to emission standards. Diversity in modes of public transport system. Notification on regulation of development along the national/State Highways/MDRS to curb ribbon development. Delineation of buffer zones along the National/State Highways/MDRS to curb ribbon development & regulate development as per the land use plan.
7. Secured tenurial rights to people including urban poor	Number and/or percentage of people having secured tenurial rights. Number and/or percentage of urban poor having secured tenurial rights.

5.11 Municipal Solid Waste

Proposed actions to address specific Municipal Solid Waste issues and type of response have been identified and described in Table 47. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 47 clearly delineates these agencies.

Table 47: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues/Problems	Causes	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1. Increasing gap in Municipal Solid Waste generation versus collection, treatment & disposal (rural & urban) leading to increased pollution.	☐ Increased MSW generation from population/tourists/industries. ☐ Inadequate availability of infrastructure.	☐ Increased pollution. ☐ Increased disease burden/health risks.	☐ Prepare & and implement integrated solid waste management plan for rural/urban areas/tourists destinations, including religious places & *mela* grounds as perMunicipal Solid Waste (Management & Handling) Rules.			√	√	Department of Urban Development, Department of Rural Development.	ULBs, IPH, HPPCB, DEST, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities.
			☐ Monitor the progress of integrated solid waste management plan & community sanitation projects at household level.			√	√	Department of Urban Development Department of Rural Development.	PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, ULBs, IPH, HPPCB, DEST Department of Tourism.
2. Increased public health risks due to discharge & disposal of untreated waste on land & in water bodies.	☐ Environmental pollution due to unscientific MSW ingress in water sources. ☐ Unhygienic methods of handling waste. ☐ Poor waste management.	☐ Increased incidences of diseases. ☐ Public health risks.	☐ Prepare & implement integrated solid waste management plan at rural/urban levels.			√	√	Department of Urban Development, Department of Rural Development.	IPH, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities, HPPCB, DEST, Department of Tourism
			☐ Promote door to door Municipal Solid Waste collection and segregation through innovative mechanisms to meet the challenge of unavailability of personnel.				√	Department of Urban Development Department of Rural Development.	PRIs, NGOs, CSOs, Health & Family Welfare Department, HPPCB, Municipalities, DEST, , Department of Tourism.

3. Increased public health risks due to solid waste littering and improper disposal (MSW collection, treatment and disposal) at tourist units/destinations/ circuits/religious places/heritage sites/trekking & transportation routes.	☐ Inadequate sanitation infrastructure (rural & urban) ☐ Unregulated tourist transit points ☐ Drinking water source/transmission and distribution coming in contact with Municipal Solid Waste.	☐ Increased disease burden/mortality.	☐ Prepare & implement micro level MSW projects to ensure proper solid waste management.			√	Department of Urban Development, Department of Rural Development.	IPH, Health, DEST, HPPCB, NGOs/CSOs, PRIs.
			☐ Develop & implement integrated solid waste management plan as part of Tourism Master Plan.		√	√	Department of Urban Development Department of Rural Development.	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB Department of Tourism.
			☐ Design & implement fiscal mechanism to incentivise & provide for implementing integrated solid waste management plan.			√	Department of Urban Development Department of Rural Development, DEST.	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.
4. MSW littering in the vicinity of catchment areas of water bodies leading to pollution.	☐ Lack of MSW monitoring. ☐ Independent infrastructure for MSW management.	☐ Resource loss, catchment degradation/water pollution.	☐ Deployment of appropriate technological options to prevent scattering of MSW by monkeys, stray dogs & other animals.		√	√	Department of Urban Development, Department of Rural Development,	Forest, Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.
			☐ Implement periodical campaigns for MSW collection for monitoring aesthetics.	√		√	Department of Urban Development, Department of Rural Development, DEST.	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.

			□	Prepare & implement wetland management plan.		√	Department of Urban Development, Department of Rural Development, DEST	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.
			□	Develop & implement basin wise/district wise rain water harvesting programme.	√	√	Department of Urban Development, Department of Rural Development, DEST	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.
			□	Constitute a State level Steering Committee to implement the three plans in an integrated manner.	√	√	Department of Urban Development, Department of Rural Development, DEST	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism.
5. Poor segregation of MSW at source.	□ Lack of awareness. □ Consumer behaviour. □ Variation in MSW compression. □ Unavailability of technology at the source of segregation.	□ Increased pollution. □ Reduced resource recovery.	□	Ensure door to door MSW collection system.	√	√	Department of Urban Development Department of Rural Development, DEST, M.C.	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism, M.C.
			□	Promote door to door collection, transportation & disposal including outsourcing.	√	√	Department of Urban Development, Department of Rural Development, DEST, M.C.	Infrastructure Developers, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism M.C.

				Promote & implement decentralised waste management including composting.		Department		of Urban Development, Department of Rural Development, DEST, M.C..	Infrastructure Developers, DEST, HPPCB, Operators, NGOs/CSOs/ IPH/ULBs, DEST, HPPCB, Department of Tourism, M.C.
6. Inadequate finance to accelerate/upgrade/implement MSW/sanitation infrastructure leading to poor sanitation.	Inadequate pricing of resource. Continued subsidy. Resource under valuation. Government expenditure.	Increased pollution due to inadequate infrastructure.		Implement Private Sector participation for collection, transportation & disposal of Municipal Solid Waste.		√	√	ULBs.	Infrastructure Developers, DEST, HPPCB, Operators, NGOs/CSOs/ IPH, Department of Urban Development
				Carry out viability studies for different economic instruments. Implement 'Payment for Environmental Services/Polluter Pays' in sanitation sector in the State & implement the solution.	√	√	√	Department of Urban Development.	Consultants, IPH, ULBs, DEST, HPPCB, Departments of Health & Family Welfare.
7. Gaps in Mechanism related to MSW/sanitation leading to reduced efficiency.	Inadequate implementation of reforms. Inadequate integrated planning & coordination.	Gaps in service delivery. Increased pollution.		Constitute a State level Coordination Committee to prioritise & implement sanitation plans integrated with, programmes & projects.	√	√	√	Department of Urban Development.	DEST, HPPCB Department of Rural Development, Department of Health & Family Welfare, ULBs
				Quarterly monitoring of the progress of prioritised plans, programmes & projects.	√	√	√	Department of Urban Development.	IPH, Department of Rural Development, DEST, HPPCB, Department of Health & Family Welfare, ULBs
8. Inadequate Private Sector/PRI participation in MSW/sanitation sector leading to reduced coverage of sanitation services.	Inadequate implementation of reforms. Lack of a business model.	Reduced infrastructure development. Gaps in service delivery. Increased		Accelerate & implement time bound reforms/programmes/projects leading to Private Sector & NGO participation in the sector.		√	√	Department of Urban Development, Department of Rural Development	DEST, HPPCB/ PRIs/NGOs/CSOs, IPH, ULBs

			Accelerate/implement actions/projects under PRI sanitation plans at village level.	√	√	Department of Urban Development, Department of Rural Development .	IPH, PRIs/Health & Family Welfare Department, DEST, HPPCB.
			Develop & implement gender empowerment & participation under rural sanitation projects.	√		Department of Urban Development, Department of Rural Development.	IPH, PRIs / Health & Family Welfare Department, DEST, HPPCB.
9. Inadequate awareness leading to low community/NGO participation in MSW service & sanitation.	Inadequate ownership. Difficult terrain & dispersed location. Inadequate gender participation. Inadequate NGO participation.	Unhygienic living conditions/disease burden. Increased Government expenditure for sanitation management. Increased pollution.	Accelerate/Initiate action for implementation of IEC programmes under each health/urban scheme/ programmes being implemented at State level.	√	Department	of Urban Development, Department of Rural Development.	DEST/IPH, HPPCB, Rural Development Department/PRIs /CSOs, HPPCB, Health & Family Welfare Department, ULBs
			Design & Initiate awareness generation programmes/projects with NGOs/CSOs/PRIs/ULBs.	√		ULBs/PRIs..	PRIs/NGOs, Department of Urban Development, Department of Tourism.
10. Lack of skilled personnel in MSW management.	Inadequate regulatory compliance Inadequate participatory approach.	Loss of valuable resource. Failure of formal sector Muncipal Solid Waste financial model. Increased pollution due to treatment & disposal in informal sector.	Mainstreaming of informal sector into Muncipal Solid Waste management. Deployment of appropriate staff should be mandatory at least at the Council level, like Environmental Engineer and Health Officer to address Environmental Issues & Management.	√	√	ULBs/PRIs	Private Sector, Department of Urban Development, Departments of Rural Development, PRIs, NGOs, CSOs, Health & Family Welfare Department, Municipalities

11. Lack of sites for setting up Solid Waste Management facility.	□ Non-availability of land. □ Inadequate Planning.	□ Unhygienic living condition/burden of disease. □ Increased pollution due to inadequate infrastructure.	□ Site selection for Muncipal Solid Waste facility should be as per MSW Rule, 2000. □ Site should be marked for MSW facility in the City/Town development plans at the planning stage if land is available. □ Strict monitoring of all environmental issues. □ The role of HP Pollution Control Board should be enhanced at actual implementation level.	√	√	√	Town & Country Planning	Revenue Department, Department of Forest, ULBs, PRIs, Department of Urban Development, Department of Rural Development, HPPCB, DEST,NGOs/CSOs,

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 48. These monitoring requirements should be strictly followed for Municipal Solid Waste management.

Monitoring and reporting of Municipal Solid Waste collected, treated and disposed off in Urban Local Bodies. This data should be processed, analysed and published at least thrice in a year.

Monitoring of integrated rural/urban solid waste management plans/projects should be carried out quarterly. This data should be documented, reported and published quarterly.

Monitoring and reporting of disease occurrence: Monthly monitoring of occurrence of water borne disease should be carried out. Data of hospitalisation and mortality should be recorded every month. The monitoring report has to be documented and reported quarterly by the coordinating Department.

Monthly monitoring has to be carried out for the following:

- Sanitation infrastructure, e.g., collection, transportation.
- Regular monitoring of Muncipal Solid Waste treatment plant structures, its operation and maintenance.
- Regular monitoring of Treatment, Storage & Disposal facility.

Monitoring of awareness campaigns: Annual tracking of awareness programmes/campaigns needs to be carried out. The areas include industrial waste, municipal solid waste and toxic chemicals. Conduct annual surveys to find the effectiveness of different campaigns and reformulate the communication strategy of the awareness programmes.

Creation of common platform for inter-Departmental coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update on the State Government's website and other State Department's websites should be carried out. An annual State Environment Report can be published, which will contain a Chapter on sanitation sector in the State. This Chapter will summarise the analysis of monitored data and performance of the sector based on the following performance indicators.

Performance Indicators: For macro-level management of sanitation related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 48 will have to be monitored and reported by the concerned coordinating agency/ Department.

Table 48: Performance Indicators

Outcomes	Indicators
1. Muncipal Solid Waste management.	Percentage of MSW generated versus treated.
2. Scientific management of Solid Waste Management.	Number of integrated solid waste management plan development & implementation.
3. Implementation of health improvement programmes/projects.	Reduced/increased percentage of water borne disease occurrence . Number of programmes/projects identified & implemented to address each issue.
4. Degree of local participation in sanitation management.	Number of sanitation management committees formed. Number of issues raised & addressed.
5. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media. Number of trainings imparted to officers & staff of line & associated Departments. Creation of data bank at the coordinating agency & regular publications on State Government website.
6. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New & effective enforcement mechanisms in force.

5.12 Hazardous Waste

Proposed actions to address specific Hazardous Waste issues and type of response have been identified and described in Table 49. In Himachal Pradesh, there are many Departments with overlapping and inter-connecting responsibilities in providing services. They are required to focus and channelise their course of work in order to have an integrated planning. For this, inter-sectoral coordination in planning, execution and monitoring is required. It is important to note that planning and execution of any type of response requires identification of coordinating and collaborating agencies. Table 49 clearly delineates these agencies.

Table 49: Proposed Actions, Type of Response and Inter-sectoral Responsibilities

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
1 Improper siting of Industries.	☐ Concentration of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. ☐ The siting of Industries is being done as per the available land bank & not as per the Zoning Atlas for Industries.	☐ Over extraction of mineral resources & environmental pollution.	☐ Undertake Regional EIAs/Cumulative Impact Assessment. ☐ Complete Zoning Atlas for industrial siting & strict implementation of siting criteria. ☐ Preparation of Region specific map for siting (in GIS environment). ☐ Preparation of Region-specific industrial siting guidelines. ☐ Revisiting land-use around hazardous units (in case industry is already commissioned). ☐ Prepare district-wise Environmental Atlases. ☐ Proper appraisal of the site with respect to environmental issues. ☐ Concept of sustainable development to be kept in view while considering mining project. ☐ If all clearances are through for grant of			√	√	Department of Industries.	Planning Department, HP State Land Use & Wasteland Development Board, Department of Industries, CPCB, HPPCB, Industry Associations, DEST, NGOs/CSOs.

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			mining lease, strict implementation of mining plan, mine closure plan, EIA/EMP document, PCB conditions of consent, MoEF/Forest Department conditions etc. □ Strict monitoring of all environmental issues.						
2 Ambient Air Quality/Air Pollution due to dust generated during various processes of mining.	□ Dust generated due to various mining activities causing air pollution.	□ Exceedence of National Ambient Air quality Standards (NAAQS). □ Impact on human health, particularly that of industrial workers.	□ Strict implementation of urban master plan including zonation. □ Preparation & implementation of green belt management plan & restoration of exposed area as part of industrial estate development plan. □ Disposal of loose material at designated places.		√ √	√	√ √	Department. of Urban Development / ULBs. -do- Department of Industries.	Department of Industries -do- CPCB, HPPCB, Department of Transport, HPPWD, Himachal Pradesh Infrastructure Development Board, Department of Tourism.

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
3. Deteriorating water quality and quantity.	☐ Concentration of industries in Shivalik Himalaya and focus on extraction of few mineral resources.	☐ Further, deterioration of quality water in terms of benchmarks set in Primary Water Quality Criteria and Designated Best Use of Fresh Waters (A-E)	☐ Optimistion of waste usage by introducing concept of 3 Rs (Reduce, Recover & Recycle & zero discharge industry. ☐ Prepare & implement water harvesting plan to ensure water conservation and check lowering of water table.				√	Department of Industries IPH	CPCB, HPPCB, DEST, NGOs/CSOs, Department of Industries, Central Ground Water Board, DEST.
	☐ Ancillary development in the industrial area including urban infrastructure development entailing construction activities, improper discharge of industrial effluents (treated/untreated), sewage & municipal solid wastes.	☐ Water table decreases locally, often drastically, resulting in the drying up of wells and springs in the neighbourhood.	☐ Strictly monitor exposed area restoration plan as part of Environment Management Plan of mines.				HPPCB	HPPCB	Department of Industries, Industry Association, DEST, Department of Industries, HP Infrastructure Development Board, Department of Tourism .
	☐ Deeper excavation on the surface or underground digging.	☐ Adverse effect on water users and the aquatic ecosystem. The impact is particularly significant if water users downstream of the site are	☐ Strictly monitor water quality in mined areas & industries.					HPPCB	Industry Associations, IPH, ULBs, HP Infrastructure Development Board, Department of Tourism.
	☐ Exposure of fresh rocks due to mining initiates weathering with the inevitable generation of substances which								-do-

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	cause water pollution. Mining activities increase suspended solids & chemical contamination in the water at the site & downstream.	abstracting water for drinking/domestic use. Suspended solids can also significantly increase water treatment costs.							
4. Inadequate hazardous waste treatment and disposal.	Congregation of industries in Shivalik Himalaya & focus on extraction of a few mineral resources. Hazardous waste in Himachal Pradesh comprises sludge from Effluent Treatment Plant, Waste, Oil, Contaminated Containers, Others (Residual wastes) & Process Residue Gaps in hazardous waste generation & treatment Inadequate number of Common Effluent Treatment Plants (CETPs) & treatment facilities, e.g., there is no CETP for Baddi	Gaps between hazardous waste generation & treatment may increase further leading to deterioration of water quality	Strict implementation of hazardous waste management plan as part ofEnvironment Management Planof mines.. Implementation of hazardous waste infrastructure development plan, e.g., Common Effluent Treatment Plant /Treatment, Storage and Disposal Facility Strict monitoring of hazardous waste generation and disposal			√ √	√	Department of Industries. Industry Associations. HPPCB	HPPCB, DEST. HPPCB, DEST. DEST, Department of Industries, Industry Associations, CSOs, NGOs.

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	& Barotiwala area								
5 Land degradation.	☐ Land use pattern undergoes change due to use of land for mining, excavation, dumping & other associated activities. ☐ Digging of open pits & dumping of overburden rock mass in the form of heaps. ☐ Polluted water from pits affects the characteristics of the topsoil, thereby affecting the end use. The damage pattern on the surface undergoes a change due to alterations in the surface topography due to mining & associated activities.	☐ Land use in the surrounding areas is affected due to the impact of mining on water regime. ☐ Change in value of the land & surrounding areas.	☐ Development & implementation of exposed area restoration plan as part of EMP in mined areas. ☐ Restoration/conservation of drainage pattern of industry & mine areas as part of exposed area restoration plan. ☐ Strict implementation of Catchment Area Treatment integrated with exposed area restoration plan.			√	√	HPPCB Department of Forests.	Revenue Department, Planning Department, Himachal Pradesh State Land Use & Wasteland Development Board, Industry Associations, HBSEB, HPPCL, HIMURJA, SJVNL, Department of Energy, HP PWD, HPPCB, DEST. IPH, Industry Associations
6 Loss of Flora and Fauna.	☐ Removal of all vegetation (flora) & fauna from the area for mining & other purposes. ☐ Pollution of water in the surrounding water	☐ Loss of natural vegetation cover by clear felling, smothering & dust.	☐ Strict implementation of compensatory afforestation plan as part of Environment Management Plan. ☐ Strict implementation of buffer zone management plan as part of industrial				√ √	Department of Forests Department of Industries	Planning Department, HP State Land Use & Wasteland Development. -do-

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
	bodies due to flow of debris on the slope affects the aquatic ecology of water bodies. □ Dust in the atmosphere is contributed by mining and associated activities. Dust when deposited on the leaves of the plants in the surrounding areas, retards their growth.		estate development/mine development areas. □ Formulation & implementation of an integrated compensatory afforestation, buffer zone management plan. □ Monitoring of green cover.			√		Office of Chief Secretary -do-	All Line Departments. Forest Department, Forest Survey of India.
7Limited technological options to switch to green/clean technologies.	□ Inadequate incentives for setting up/switching to green/clean technologies. □ Inadequate understanding of green/clean technologies, which could be introduced in Himachal Pradesh.	□ Deterioration of baseline environment conditions of land, water, air & noise. □ Increased capital cost & investment for setting /switching to green/clean technologies.	□ Identify the areas where introduction of clean technologies is possible; □ Identify the source(s) from where clean technology & data/details thereof can be obtained; □ Assess the technology available indigenously as well as those to be imported; □ Modify the technology, if necessary & demonstrate it to the satisfaction of the users so that it can be replicated; □ Undertake Research & Development to develop technologies for cleaner production; □ Collect, collate & disseminate information			√	Industries	Department	HPPCB, DEST.

Issues / Problems	Cause	Impacts/Risks	Proposed Actions	Response				Institutional Responsibility	
				Policy	Plan	Programme	Project	Coordinating Agencies	Collaborating Agencies
			on clean technology □ Maintain interaction with the industry, financial institutions & Research & Development Laboratories for adoption of clean technologies.						
8 Occupation health of workers in industries handling hazardous waste.	□ Inadequate usage of PPE □ Inadequate safety systems in industries.	□ Increased health risks/disease burden.	□ Strict monitoring of safety systems in industries.			√		Department of labour.	DEST/HPPCB, Department of industries, Directorate of factory.
9.Mercury waste/Mercury contaminated waste management & disposal.	□ Inadequate safetysystems in industries □ Inadequate hazardous waste management system.	□ Deterioration of baseline environment conditions of land, water & air. □ Increased health risks/disease burden.	□ Strict implementation of Hazardous waste management plan as part of EMP. □ Inventrization of sources. □ Strictly monitor water quality.			√	HPPCB.	DEST,	Department of industries, Directorate of factory.

Monitoring and Reporting

Monitoring and reporting requirements with respect to response have been described below and performance indicators have been identified in Table 50. These monitoring requirements should be strictly followed for hazardous waste management.

Monitoring and reporting of Hazardous Waste collected, treated and disposed Treatment, Storage and Disposal Facility/Common Effluent Treatment Plant. This data should be processed, analysed and published at least thrice in a year.

Monitoring of integrated Hazardous Waste management facilities should be carried out quarterly. This data should be documented, reported and published quarterly

Monitoring and reporting of disease occurrence: Monthly monitoring of occurrence of water borne diseases should be carried out. Data of hospitalisation and mortality should be recorded every month. The monitoring report has to be documented and reported quarterly by the coordinating Department.

Monthly monitoring has to be carried out for the following:

- Hazardous Waste management infrastructure, e.g., collection, transportation and disposal.
- Regular monitoring of Hazardous Waste treatment plant structures, its operation and maintenance.
- Regular monitoring of Treatment, Storage and Disposal Facility/Common Effluent Treatment Plant facilities.

Monitoring of awareness campaigns: Annual tracking of awareness programmes/campaigns needs to be carried out. The areas include industrial waste and toxic chemicals. Conduct annual surveys to find the effectiveness of different campaigns and reformulate the communication strategy of the awareness programmes.

Creation of common platform for inter-Departmental coordination: Conduct monthly meetings. Coordinating agency should prepare minutes of these meetings and distribute to all the relevant agencies. Publish the abstracts of the meeting via different media.

Daily update of State Government's website and other State Department's websites should be carried out. An annual State of Environment Report can be published, which will contain a chapter on Hazardous Waste sector in the State. This chapter will summarise the analysis of monitored data and performance of the sector based on the following performance indicators.

Performance Indicators: For macro-level management of sanitation related issues identified and to gauge the performance of the above proposed actions, the following indicators are suggested to measure the outcome of these guidelines. These indicators as outlined in Table 50 will have to be monitored and reported by the concerned coordinating agency/Department.

Table 50: Performance Indicators

Outcomes	Indicators
1. Hazardous Waste Management. 2. Scientific Management of Hazardous Waste.	Percentage of Muncipal Solid Waste generated versus treated. Percentage of Hazardous Waste generated versus treated. Number of integrated solid waste management plan development & implementation.
Implementation of health improvement programmes/projects.	Reduced/increased percentage of occurrence of water borne diseases. Number of programmes/projects identified & implemented to address each issue.
3. Degree of Industries/Industry associations participation in Hazardous Waste management.	Number of Industries/Industry associations participating/formed. Number of issues raised & addressed.
4. Awareness about the issues.	Number of awareness campaigns conducted on each issue via different media for mass awareness; activities carried out through distribution of publicity materials, like posters, pamphlets etc. on pesticides, environment and safety, metals, warning labels on hazardous materials, chemical hazards (bi-lingual posters, proper usage of pesticides, do's and don't's. Number of trainings imparted to officers and staff of line and associated Departments. Creation of data bank at coordinating agency & regular publications on State Government's website.
5. Inter-sectoral coordination & integrated planning.	Creation of Inter-sectoral forums/platforms. Regular meetings of such forums. New and effective enforcement mechanisms in force.

Chapter 6: Inter-Relation Between Monitoring & Evaluation With Vulnerability Assessment

All the monitoring measures will provide input for redefining the 'Vulnerability' state for different regions in Himachal Pradesh. This will ultimately influence the Environmental Master Plan and may call for readjustment and fine tuning the scope of sector specific plans. It is a dynamic process and will need to be continually updated with changing pressures, needs and attitude of the society. This is represented in Figure 2.

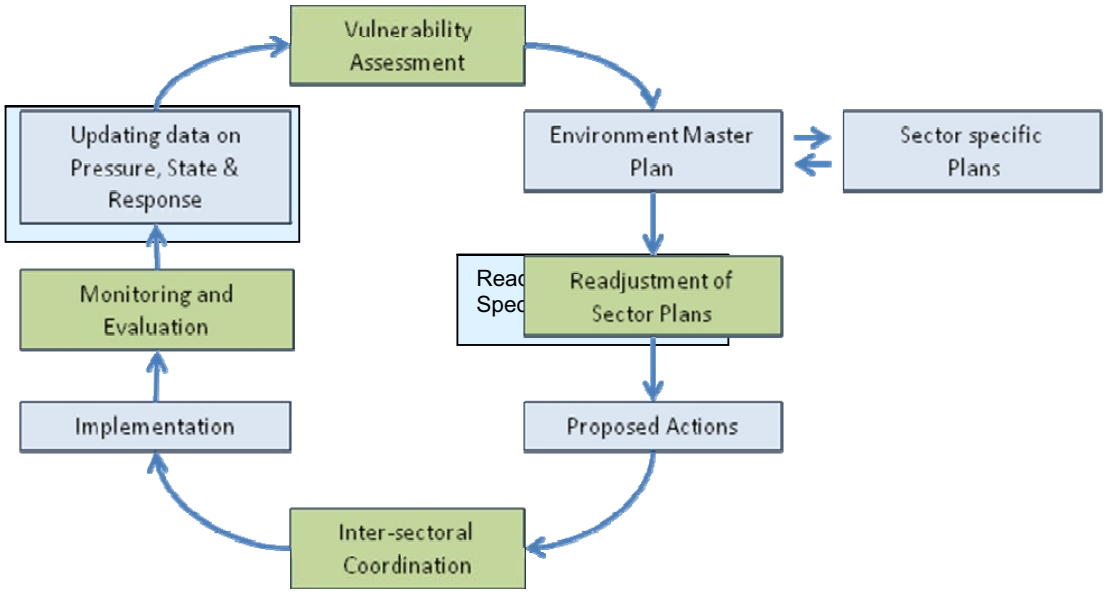

Figure 2: Inter-relation between Monitoring Measures with Vulnerability Assessment

In the above sections, good practices and issue specific mitigating measures/action plans have been proposed for the betterment and strengthening of services and management of the Tourism, Art and Culture,Sewage, Health, Road & Transport, Mining & Geoology, Industry, Energy, Market Infrastructure, Rural Planning, Urban Planning, Municipal Solid Waste & Hazardous Waste sector. This calls for inter-sectoral coordination for effective implementation of these proposed actions. The monitoring and evaluation of the proposed actions delineated in Section-V will provide an input to define the state of tourism, pressures and response in the region, which will redefine the vulnerability of the region and hence the Environment Master Plan, and the Tourism, Sewage, Health, Road & Transport, Mining & Geoology, Industry, Energy, Market Infrastructure, Rural Planning, Urban Planning, Municipal Solid Waste & Hazardous Wastesector plans.

Chapter 7: Recommendations

7.0 Tourism, Art & Culture

Develop tourism related infrastructure as per State and area specific Master Plan. These Master Plans should be based on zonational land use and expected tourist arrivals. Further, new tourist destinations should be developed to decongest the existing top five tourist destinations. Provide basic tourist infrastructure and reliable services at tourist destinations as per the Master Plan. Encourage spreading of tourism activities outside already developed towns and popular places of visit, like Manali by imposing restrictions on hotel construction in towns. Decongestion of roads by restricting vehicular traffic near the pilgrim centres should be carried out. Provide upgraded and new eco-friendly amenities and services to meet their needs. Water supply, sewage, Municipal Solid Waste and traffic and transportation should be essential components of these Master Plans.

Develop and implement Public Private Partnership for new tourist circuits and destinations. Lease out all tourism related properties like heritage bungalows, temple sites, forts, palaces and other heritage properties to private parties and strict monitoring for keeping these places clean and ensuring that no damage is done to the heritage buildings. Invite bids for leasing these properties. The term of the lease should be sort, thus leaving room for improvement for the management of such properties over the years. Lay special emphasis to attract private fund for setting up of new hill stations, water sport related resorts, ropeways including Ski Resorts, Spas, Eco-Tourism related projects etc.

All the sectoral recommendations related to project and programme implementation for safe drinking water, sanitation, waste management, transportation, air pollution, disturbance to ecology, issues like disruption of electricity supply and tourist infrastructure should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programme and plans identified and highlighted in Table 25 should be implemented.

The State should develop environmental code of conduct for tourism and ecotourism and ensure its strict implementation by surveillance and monitoring through community participation, Department of Tourism and Civil Aviation, Himachal Pradesh Pollution Control Board, Department of Forests and Wildlife, Civil Society Organizations and Non Government Organisations.

The State should make seasonal/controlled licensing of *dhabas* mandatory, subject to fulfilling of minimum conditions of provision of safe drinking water supply, sewage/latrines and disposal of solid waste.

The State should develop off-grid or community electricity supply plan for tourist circuits/destinations using solar and biogas energy.

A few regulatory interventions include either broadening of the scope of existing regulations related to non-biodegradable waste to include all dry batteries or develop new regulation on Extended Producer Responsibility (EPR).

Inter-departmental co-ordination between different Departments, like Department of Tourism and Civil Aviation, Tourism Development Council, ULBs, PWD, IPH, Transportation, *Himurja*, DEST, HPPCB, PRIs, Public Relations, Association of *Dhaba* Operators, Tourism Unit Operators, Forests, NGOs, CSOs is needed for effective planning, implementation and monitoring of health intervention programmes.

Training and capacity building of PRIs should be taken up on a priority basis. To conduct special capacity building courses and seek support from Government of India under its '*Atithi Devo Bhava*' scheme.

Establish a system of data collection and analysis of statistics related to tourism, especially tourist arrivals in the State. Tourism monitoring data should be compiled and updated regularly. It should be linked to district level information system in the State so that area specific plans, programmes and projects can be monitored and information on tourism can be accessed.

For efficient and smooth functioning of Tourism, Art and Culture sector, adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

To seek maximum assistance from Ministry of Tourism, Government of India for funding under various schemes, like Circuits, Destinations etc. and to work towards conservation through Tourism Council and funds generated by the Manali model.

7.1 Potable Water Supply

A demand–driven, participatory approach should be adopted. Village *Panchayat*/community should be given powers to plan, implement and manage. Adopt integrated approach to water, sanitation and hygiene, groundwater conservation and rain water harvesting.

Capacity development of the community to plan, implement and manage the Rural Water Supply Schemes of their own choice. Implement decentralization of services and hand it over to local Governments or Panchayati Raj Institutions.

The major areas for capacity building, identified for both urban and rural water supply programme in the sector include: awareness generation amongst Himachal Pradesh population; training to Government personnel on environmental issues, their responsibilities, planning, implementation, monitoring and surveillance; other education and information dissemination forums.

Various mechanisms for information dissemination and awareness generation could be implemented through existing programmes as well as through Departments whose activities impact the sector. NGOs, academic institutions and other State level communication units can be deployed for the purpose. This includes Communication and Capacity Development Unit's initiatives at the State level.

Communication and Capacity Development Unit is a State specific Unit for institutionalising Information Education & Communication (IEC) and Human Resource Development (HRD) activities. It acts as a catalyst to provide guidance, technical support, motivation and facilitation to the community for the implementation of programmes like '*Swajaldhara* & Total Sanitation Campaign' in water and sanitation sectors.

Government of India supports Communication and Capacity Development Unit (CCDU) in each State for promoting the reforms initiatives introduced in Water Supply and Sanitation sector. The main function of the unit is to provide IEC/HRD support to the State Water and Sanitation Missions. The unit provides HRD/IEC inputs to all the running projects and programmes in the State. Further, the unit documents successful IEC/HRD initiatives taken (within the State) in other States and agencies and dissemination of the same to field functionaries.

National Lake Conservation Plan recommends that a 'Steering Committee' under the DM/Collector of each district may be constituted with representation from Lake Development Authority (LDA)/Lake Conservation Authority (LCA), State Government and all executing agencies of the projects sanctioned in each district. Representation of stakeholders and a prominent NGO of the area may be ensured.

Alternatively, a lake specific monitoring committee may be constituted at local level.

In the absence of specific water quality criteria developed in respect of lakes, for the time being, a Designated Best Use criteria for surface waters for bathing quality as given by Central Pollution Control Board (CPCB) shall be the target for lake water quality.

Inter-Departmental co-ordination between different Departments, like Department of Forests and wildlife, Department of Tourism and Civil Aviation, Tourism Development Council, ULBs, PWD, IPH, Transportation, Himurja, DEST, HPPCB, PRIs, Public Relations, tourism unit operators, NGOs, CSOs, etc. is needed for effective planning, implementation and monitoring of water sector intervention programmes.

All the sectoral recommendations related to project and programme implementation for safe drinking water, sanitation, waste management and inadequate health infrastructure, should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programmes and plans identified and highlighted in Table 27should be implemented.

For efficient and smooth functioning of water sector, adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

Training and capacity building of Panchayati Raj Institutions should be taken up on a priority basis.

7.2 Sewage

A paradigm shift is needed from supply driven to a demand responsive approach; from centralised to decentralised service delivery; from the top down to the bottom up approach; and ultimately, change in the roles of the Government from that of a service provider to a facilitator. In this context, the sector reforms were scaled up from end 2000 in the form of *Swajaldhara,* which was initiated throughout the country. The challenge now is to consolidate and sustain the reform initiatives. This calls for establishing necessary institutions and developing necessary competencies for internalisation of reform initiatives in the community. Involvement of three tiers of *Panchayati Raj* Institutions, social mobilisation, capacity development and communication processes are the core components of *Swajaldhara* and Total Sanitation Campaign (TSC) projects. A holistic reform process is required to be implemented at the State level. These may include: Full ownership of drinking water assets with appropriate levels of *Panchayats*; *Panchayats*/communities to have the power to plan, implement, operate, maintain and manage all water supply and sanitation schemes; 100 percent responsibility of operation and maintenance by users; an integrated service delivery mechanism; and shift in the role of the Government from direct service delivery to that of planning, policy formulation, monitoring and evaluation and partial financial support.

The sewerage facility should be extended to all major towns. The treatment of sewage is necessary and urgent steps are required to be taken for the disposal of treated sewage in the rivers. In several towns, sewage water, after proper treatment, can be recycled for domestic use. Since sanitation is a Municipal function, it should be transferred to the ULBs along with staff working in the urban areas for maintaining and augmenting the sewerage system. The cost of Operation and Maintenance of sewerage should be recovered progressively.

Waste water treatment must be made mandatory for all sizes of urban centres. The smaller urban centres could use less decentralised and less capital intensive technologies to reduce capital cost as well as maintenance cost of treatment.

Recycling/reuse of waste water is practiced in very few urban centres and wherever it's done, it's mostly used for agriculture and horticulture purposes. Recycling/reusing waste water should be adequately factored into project design and operational stage, so as to reduce the demand for fresh water, which will also, thereby, postpone the capital investment for water augmentation.

Sewage/waste water is not charged for all urban centres, therefore, cost recovery is generally very low from this service. Provision of connection charges (on new connections) and levying of sewerage/drainage tax should be made. It could be factored in property tax, a charge on water closet, or an additional charge on water supplied should be levied. All agencies dealing with waste-water must prepare plans for cost recovery from this service.

Pollution of land or water body with untreated waste water should be made punishable with the imposition of fine.

It is recommended that the use of low-cost technologies, the unbundling of services to involve the Private Sector and proper packaging, i.e., clubbing together water supply and drainage projects can reduce the project cost and improve its viability.

Private Sector participation to be promoted to increase stakes in sewage/waste water management and to meet additional capital investment requirements.

Specific Recommendations for Rural Sanitation: Proper evaluation of the project objectives should be undertaken by all the districts, so as to distribute the enhanced targets as per the revised projects to all the *Gram Panchayats* in the districts. Undertake revision of the projects wherever required. Preference should be given to the twin (leach) pit technology and use of local materials for the (Individual House Hold Latrines); proper record keeping of Total Sanitation Campaign (TSC) related activities/achievements should be carried out at the Block/*Gram Panchayat* levels; to ensure the maintenance of the Community Toilets, these could be handed over to the *Sulabh* International/other NGOs as per the requirements; establishment of effective institution level setup at District/Block/*Gram Panchayat* levels under TSC; Nodal Officer for overseeing the progress of TSC to be nominated at all the levels; all the districts should co-ordinate with the Departments of Social Justice and Empowerment, Education and Health and help them in the appointment of Nodal Officers at the district level; districts having MVSSP and *Nirmal Gram Puraskar* Winner *Gram Panchayats* are requested to publicise the success stories of such *Gram Panchayats;* ensure water facility in all the schools with the help of the IPH Department; inter-sectoral and inter-Departmental communication is important to start or plan a sewerage project (It can either be a project or a sectoral plan); sensitise all Stakeholders via different media; conduct public consultations – sometimes, it may not be mandatory to conduct public consultation, still it will be better to communicate and generate community participation in almost all works; develop in-house capacity. It is important to train the officials of the State and local bodies, who will be directly and indirectly involved with the project or plan. Various workshops can also be organised to train and sensitise senior officials; emphasise on green procurement. Try to buy products, which cause least harm to the natural resources and also popularise it. Contract only those contractors, who are ISO 14001 certified, and also introduce E&S covenants in the contracts; ensure that good practices are encouraged at all levels – planning, siting, execution, operation and maintenance; ensure regular monitoring of all parameters, proposed actions and indicators and keep tracking environmental and social issues; document everything; advocate policies/plans/programmes as and when required. Address issues that need to be subsidised or non-subsidised for better overall returns; update the websites regularly and publish annual reports; update Vulnerability Assessment.

A demand–driven and participatory approach should be adopted and Village *Panchayat*/community shall be given the power to plan, implement and manage. Adopt integrated approach to water, sanitation and hygiene, groundwater conservation and rain water harvesting.

Capacity development of the community to plan, implement and manage rural water supply schemes of their own choice. Implement the decentralisation of services and hand them over to Local Governments or PRIs. Other than the Local Government, it is also important to train decision makers and other Departmental staff to understand the inter-relationships between sectors and their responsibilities towards integrated planning and sustainable development of the State. Further, awareness generation amongst the population about the environmental and social issues and accepting behavioural changes for water conservation is required.

The major areas for capacity building, identified for both urban and rural water supply programmes in the sector include: awareness generation amongst Himachal Pradesh population; training to Government personnel on environmental issues, their responsibilities, planning, implementation, monitoring and surveillance; other education and information dissemination forums.

Adopt various mechanisms for information dissemination and awareness generation; implementation could be through existing programmes as well as through Departments, whose activities impact the sector. NGOs, academic institutions and other State level communication units can be deployed for the purpose. This includes Communication and Capacity Development Unit's initiatives at the State level.

Training for mainstreaming environmental and social issues in water supply/sanitation sector: mainstreaming of environmental and social issues in water supply sector can be achieved by imparting training on implementing good management practices described in Section 4. These good management practices can be transformed into module level training programmes and imparted to line agencies based on their requirements. Further, it is recommended that designated officer in each line agency be trained so that he/she can act as a trainer at all levels of planning and implementation.

Inter-Departmental co-ordination between different Departments, like the Department of Forests and Wildlife, Department of Tourism, Tourism Development Council, ULBs, PWD, IPH, Transportation, Himurja, DEST, HPPCB, PRIs, Public Relations, Tourism Unit Operators, NGOs, CSOs is needed for effective planning, implementation and monitoring sewage sector intervention programmes.

All the sectoral recommendations related to project and programme implementation for safe drinking water, sanitation, waste management and adequate health infrastructure, should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programmes and plans identified and highlighted in Table 29 should be implemented. For efficient and smooth functioning of sewage sector, adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

7.3 Health

The State has a Health Vision document. Considering the fact that, with the changing composition of the population, changing life-styles, urbanisation and industrialisation, Himachal Pradesh would have newer morbidity challenges in the future, it should work on a State Health Policy with a proper time schedule for different activities. The policy should clearly spell out the future health care requirements of the State in the field of

preventive, promotive, curative and rehabilitative health care.

Focused attention needs to be given to curative aspects of health care, particularly in a hilly State like Himachal Pradesh, where the share of the Private Sector in the number of illness episodes treated is almost negligible. Strengthening the existing public health services and widening their network through the involvement of private practitioners, voluntary Non-Government Organisations and research institutions will improve the health care services in the State.

All the sectoral recommendations related to project and programme implementation for safe drinking water, sanitation, waste management and transportation, air pollution, inadequate health infrastructure, issues like occupational health, malnutrition and communicable diseases etc. should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programmes and plans identified and highlighted in Table 31 should be implemented.

All the recommendations under National Rural Health Mission (NRHM) project implementation plan need to be implemented. The primary health care facilities in the rural areas and the existing number of medical institutions in the State are sufficient to meet the needs of the people, but their operational efficiency needs to be improved. Shortcomings, such as inadequate para-medical staff, buildings and equipments, must be overcome. The inconsistency in the distribution of primary health care facilities and manpower (more staffing in comfortable areas than in the rural and remote areas) must be rectified immediately.

Inter-Departmental co-ordination between different Departments, like Health and Family Welfare, ULBs, Transportation, Himurja, DEST, HPPCB, PRIs, Women and Social Welfare, Public Relations, NGOs, CSOs is needed for effective planning, implementation and monitoring of health intervention programmes.

For efficient and smooth functioning of the health sector, adequate monitoring and supervision is necessary. The performance of various health indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

As per (National Family Health Survey) NFHS-3 survey, only six percent of households in the State have medical insurance. Rising medical costs raises the question of available financing options. Hospitalised treatment is very expensive in both public and private sectors and leads to loss of lifetime's savings, leaving no money for future social security. It is suggested that the State Government should work out the modalities for a viable health insurance policy to meet the rising health costs in both public and private sectors.

Training and capacity building of Panchayati Raj Institutions should be taken up at priority.

Introduction of telemedicine to facilitate consultation for the treatment of illnesses in the far-flung areas of the State through connectivity with the State headquarters would be useful in reducing people's hardships and the number of patients in specialised health institutions. Further, provision of mobile medical units will augment the health service to far flung areas.

Health monitoring data should be compiled and updated regularly. It should be linked to district level health information system being developed under NRHM in the State, so that area specific plans, programmes and projects can be monitored and information on health can be accessed.

To increase the green cover, emphasis should be given on the cultivation and conservation of medicinal plants, thereby improving the

financial status of the people on the one hand and contributing towards the environment on the other. Trees having medicinal properties can be promoted for plantation on the forest land, road side or even on the private land.

7.4 Road & Transport

Training for mainstreaming environmental and social issues in road sector is required. A comprehensive training programme can be developed and implemented.

Other training aspects include integrated planning, related laws and legislations, new and innovative technologies, monitoring techniques and surveillance methods. The above mentioned aspects can be transformed into module level training programmes and imparted to line agencies based on their requirement. Further, it is recommended that designated officer in each line agency be trained so that he/she can act as trainer at all levels of planning and implementation.

Creation of special cells in the State Public Works Department to coordinate all activities related to environmental impacts of highway projects.

Removal of encroachments on National Highway / State Highway and Major District Roads land and to prevent future encroachments.

A Corridor Management Plan should be drawn up for major State Highways, so that the problems of ribbon development, encroachments, uncontrolled access and poor safety can be tackled.

Use of alternate material or recycling of existing pavements to reduce the need for more road building aggregates should be promoted after testing of material and clearance from institute like Central Road Research Institute (CRRI).

Use of bio-engineering techniques for protection of slopes in hill areas and reducing risk of landslides should be promoted.

Strict implementation and compliance to control encroachment of State roads/Highways regulations e.g., National Highway (Land and Traffic Act), 2002 for improved traffic management and control of access on National Highways and Municipal roads should be carried out.

All the sectoral recommendations related to project and programme implementation for the sector should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programmes and plans identified and highlighted in Table 33 should be implemented.

For efficient and smooth functioning of the sector adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

Training and capacity building of Panchayati Raj Institutions should be taken up on priority basis.

7.5 Mining & Geology

Strict implementation of mitigation measures identified in Environmental Management Plan should be ensured.

Implementation of all the actions identified in post closure of mines should be ensured, especially restoration of vegetation and biodiversity.

Strict monitoring of identified indicators, especially with respect to air, water, noise, waste, land use and aesthetics should be implemented and ensured.

Small and medium scale mines and artisanal mines dominate, especially in the minor mineral sector, of less than five hectares in size, which do not fall within the purview of

EIA Notification, 2006 but are required to take environmental clearance as per MoEF office Memorandum No. L-11011/47/2011-IA, II (M) dt: 18.05.2012. Inventory of such mines that operate without prior environmental and social assessment and appraisal by appropriate authorities needs to be prepared.

Control and Management of Air pollution: In regulating the Air (Prevention and Control of Pollution) Act, 1981 for control and abatement of air pollution, provisions related to consent in Section-21 of the said Act are most significant as the consent and its conditions are the foremost means for the prevention, abatement and control of pollution. This is ensured in the following manner: 'Consent to Establish' is granted after evaluation of the potential air pollution and after the examination of the engineering design and details of the systems proposed for controlling the air pollution. The conditions consistent to air pollution control requirements are incorporated in 'Consent to Establish'. These conditions are reviewed in terms of their compliance and 'Consent to Establish' is converted to 'Consent to Operate' after ensuring that the engineering systems for control of air pollution are fully implemented.

Improve productivity per unit of water consumed in mining processes, by making water assessments and water audits mandatory in identified industries and utilities. This activity should be internalised as part of Environmental Management System (EMS) of the activity is ISO 14001 certified.

Prepare and implement action plans for major cities for addressing water pollution, comprising regulatory systems relying on an appropriate combination of fiats and incentive based instruments, projects implemented through public agencies as well as Public-Private Partnerships for treatment, reuse and recycle where applicable, of sewage and wastewater from municipal and industrial sources, before final discharge to water bodies.

Prepare and implement a comprehensive strategy for regulating the use of groundwater by large mining establishments on the basis of a careful evaluation of aquifer capacity and annual recharge.

Waste minimisation, waste reduction and waste reuse needs to be attempted first to avoid waste accumulation. Dissemination of information on technological options to be a continuing exercise.

'Waste Exchange Banks/Centres' should be established to provide information on wastes and promote reuse, recovery and recycling technologies, which upscale the quality of resource recovery.

Technological aspects need to be promoted so as to conserve the fuel as well as the utilisation of waste as resource.

The Treatment, Storage and Disposal Facility need to cater to meticulously delineated hazardous waste catchment areas, taking into consideration their distances from the generators and availability of wastes. State Pollution Control Boards could ensure that in a given hazardous waste catchment area, no multiple operating Treatment, Storage and Disposal Facility exist to help maintain viability of the facilities.

Treatment, Storage and Disposal Facility need to be rigorously evaluated by the HPPCB, periodically, to ensure operation in an environmentally safe manner in compliance with the various provisions of regulations.

Survey and develop an inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacities of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes.

Surveillance of industries by HPPCB and industry associations should be stepped up to take care of illegal dumping.

Remediation strategy needs to focus on the 'Polluter Pays' principle with the polluter being asked to pay penalty as well as costs of

cleaning up the pollution. Where polluters are not traceable, a dedicated fund needs to be created by SPCB/ PCC for remediation.

The issue of interstate movement of hazardous waste should be addressed in a rational way.

In order to deal with inter-state transportation as well as disposal of hazardous wastes in a facility, the following options should be considered: To have these processed wherever possible by the industry which supplied them; to appropriately incinerate either through dedicated incinerators of individual industries or through incinerators available with common disposal facilities such as Treatment, Storage and Disposal Facility(TSDFs).

HPPCB needs to develop on-line tracking system for movement of hazardous waste from generation to the disposal/recovery/recycling stage.

HPPCB need to be strengthened in terms of manpower, equipment, instruments and other infrastructure facilities for effective enforcement of regulations. Central and State Governments should support HPPCB by periodically providing adequate funding, training and sponsoring awareness programmes.

Develop and implement viable models of Public-Private Partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of toxic and hazardous waste, on payment by users, taking the concerns of local communities into account. The concerned local communities and State Governments must have clear entitlements to specified benefits from hosting such sites, if access is given to non-local users. Develop and implement strategies for cleaning up toxic and hazardous waste dump legacies, in particular abandoned mines, and reclamation of such lands for future, sustainable use.

Develop and promote the use of standardised environmental accounting practices and norms in preparation of statutory financial statements for large mining enterprises, in order to encourage greater environmental responsibility in investment decision-making, management practices and public scrutiny.

All the sectoral recommendations related to project and programme implementation of mining sector, afforestation/reforestation of degraded land should be implemented. All the proposed actions related to response in terms of projects, programmes and plans identified and highlighted in Table 35 should be implemented.

Inter-departmental co-ordination between different Departments, like Department of Forest, Tourism, Tourism Development Council, PWD, IPH, Transport, DEST, HPPCB, PRIs, Public Relations, NGOs, CSOs, etc. is needed for effective planning, implementation and monitoring of intervention programmes.

Establish a system of data collection and analysis of statistics related to mining sector. Monitored data should be compiled and updated regularly. It should be linked to district level information system in the State, so that area specific plans, programmes and projects can be monitored and information can be accessed.

7.6 Industry

Pollution loads are closely linked to pricing policies that lead to inefficient use of agricultural chemicals and municipal and industrial water use. In particular, revenue yields for the latter two are insufficient to install and maintain sewage and effluent treatment plants, respectively. Pollution regulation for industries is typically not based on formal spatial planning to facilitate clustering of industries to realise economy of scale in effluent treatment, resulting in relatively high costs of effluent treatment, and consequent increased incentives for non-compliance. Industrial areas are primarily being created to encourage setting up of industries in such areas, so as to adhere to some degree of formal spatial planning facilitating clustering

for setting up basic infrastructure for effluent treatment, hazardous waste management, sewerage treatment etc. In Himachal Pradesh, due to geographical reasons and terrain, the size of industrial areas is relatively small. In areas where there has been growth of industry around the industrial areas created by the Department, the State is providing land at very nominal cost to the Special Purpose Vehicles being promoted together with the stakeholders for setting up of these facilities in some industrial areas. In order to make such ventures viable, there has to be a minimum number of units located in these areas. The regulatory mechanism is administered by the HPPCB whereas the pricing policies have been left largely to these Special Purpose Vehicles (SPVs), which have been created to provide these services to the industry. This model would be replicated in other industrial areas in phased manner once the minimum number of units come up in those areas. There is, accordingly, a need to review the relevant pricing policy regimes and regulatory mechanisms in terms of their likely adverse environmental impacts.

At present, Himachal Pradesh does not have in place any formal system to make water requirement assessments and water audits in identified industries and utilities. The major category of industries set up in the State, which are water consuming, relate to textiles (involving dyeing and finishing), food processing, pharma industry and consumer care products. The Industries Department could make this mandatory and IPH Department could monitor the audit results and advise about necessary interventions, which are required. This would help in improving productivity per unit of water consumed in industrial processes, by making water assessments and water audits mandatory in identified industries and utilities.

Consider and mitigate the impacts on rivers, flora and fauna, and the resulting change in the resource base for livelihoods, of multipurpose river valley projects, power plants, and industries. Department of Industries can factor this aspect while deciding or approving a location for the siting of a major industry or an industrial area. Hence, this aspect needs to be incorporated while formulating guidelines for siting of industry, so that both Entrepreneurs and Authorities in the Government are aware of the factors to consider while identifying land for their project.

Prepare and implement action plans for major cities for addressing water pollution, comprising regulatory systems relying on a appropriate combination of fiats and incentive based instruments, projects implemented through public agencies as well as Public-Private Partnerships for treatment, reuse, and recycle, where applicable, of sewage and wastewater from Municipal and industrial sources, before final discharge into water bodies.

A hazardous waste management facility has been created in the State in Public Private Partnership mode, which is operational. It is at a stage of infancy and is facing some teething problems largely related to pricing of services and scale of operation. Perhaps, it may require some statutory backing to ensure that the Industry set up uses this facility and the extent of its usage needs to be audited and monitored by the HPPCB before extending permissions to units to operate. Based on the experience of Himachal Pradesh, it is further recommended to develop and implement viable models of Public-Private Partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of toxic and hazardous waste, both industrial and biomedical, on payment by users, taking the concerns of local communities into account. The concerned local communities and State Governments must have clear entitlements to specified benefits from hosting such sites, if access is given to non-local users. Develop and implement strategies for cleaning up toxic and hazardous waste dump legacies, in particular, in industrial areas and abandoned mines, and reclamation of such lands for future sustainable use.

Further, in view of the above, survey and develop an inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacities of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes.

Further, in view of the above, strengthen the legal arrangements and response measures for addressing emergencies arising out of transportation, handling and disposal of hazardous wastes, as part of the chemical accidents regime.

Give legal recognition to and strengthen the informal sector systems of collection and recycling of various materials. In particular, enhance their access to institutional finance and relevant technologies.

Promote biodegradable and recyclable substitutes for non-biodegradable materials, and develop and implement strategies for their recycle, reuse, and final environmentally benign disposal, including through promotion of relevant technologies, and use of incentive based instruments. This involves identification of appropriate technologies and processes for processing and disposal of such products. It, therefore, requires substantial R & D inputs at the Central Government funded institutions, which should share their experiences and knowledge with the State Government, so that they may advise and encourage promotion of specific products and technologies for this purpose.

Develop and enforce regulations and guidelines for management of e-waste, as part of the hazardous waste regime.

Promote, through incentives, removal of barriers and regulations, the beneficial utilisation of generally non-hazardous waste streams, such as fly ash, bottom ash, red mud, and slag, including in cement and brick making, and building railway and Highway embankments. Certain performance based incentives, like transport subsidy, interest subsidy may be provided to such units.

Develop and promote the use of standardised environmental accounting practices and norms in preparation of statutory financial statements for large industrial enterprises, in order to encourage greater environmental responsibility in investment decision-making, management practices, and public scrutiny. This may be done by making it a statutory requirement under the Companies Act by the Central Government.

Prepare and implement a comprehensive strategy for regulating the use of groundwater by large industrial and commercial establishments on the basis of a careful evaluation of aquifer capacity and annual recharge. This could be facilitated by the IPH Department.

Improve productivity per unit of water consumed in industrial processes by making water assessments and water audits mandatory in identified industries and utilities.

Recommendations for Hazardous Waste Management: Waste generation is a dynamic phenomenon depending upon change in products, processes, capacity of production and establishment of new industries. Hence, there is a need to periodically update the national inventory on hazardous waste generation so as to facilitate decision making procedures with respect to strategies of hazardous waste management.

Waste minimisation, waste reduction and waste reuse needs to be attempted first to avoid waste accumulation. Dissemination of information on technological options has to be a continuing exercise.

Clean technology norms for each industry should be defined, so that less hazardous wastes are generated and hence the pollution caused is also reduced.

Possibilities must be explored with industrial associations/industries for options of reusing, recovering and recycling hazardous waste in an environmentally sound manner.

Payback schemes should be introduced as a part of extended corporate responsibility in case of lead-acid batteries.

A system should be developed for channellising wastes containing toxic metals for recovery, such as mercury from thermometres and fluorescent tube lights, cadmium from batteries etc.

Waste Exchange Banks/Centres should be established to provide information on wastes and promote reuse, recovery and recycling technologies, which upscale the quality of resource recovery.

Technological aspects need to be promoted so as to conserve the fuel as well as encourage the utilisation of waste as a resource.

The TSDFs need to cater to meticulously delineated hazardous waste catchment areas, taking into consideration their distances from the generators and availability of wastes. SPCBs could ensure that in a given hazardous waste catchment area, no multiple operating TSDFs exist in order to help maintain viability of the facilities.

TSDFs need to be rigorously evaluated by the HPPCB periodically to ensure operation in an environmentally safe manner in compliance with various provisions of regulations.

All TSDF operators should be asked to implement the provisions of Escrow Account as per the directive of MoEF to ensure that a separate Escrow fund is created for post closure monitoring and to deal with liability arising due to mishaps, calamities etc.

Surveillance of industries by HPPCB and industry associations should be stepped up to take care of illegal dumping.

Remediation strategy needs to focus on the 'Polluter Pays' principle with the polluter being asked to pay penalty as well as costs of cleaning up the pollution. Industries causing pollution repeatedly should be blacklisted. Where polluters are not traceable, a dedicated fund needs to be created by SPCB/PCC for remediation.

The issue of inter-State movement of hazardous waste should be addressed in a rational way.

In order to deal with inter-State transportation as well as disposal of hazardous wastes in a facility, the options which should be considered are: to have these processed wherever possible by the industry, which supplied them; to appropriately incinerate either through dedicated incinerators of individual industries or through incinerators available with common disposal facilities such as Treatment, Storage and disposal Facility such as Treatment, Storage and Disposal Facilities (TSDFs).

Adequate safety systems and procedures must be adopted during dismantling of ships and handling of hazardous wastes/materials (such as used oils, waste oils, asbestos containing panels/tiles, damaged asbestos containing material, paint chips, and used chemicals, like acids etc.).

HPPCB needs to develop on-line tracking system for movement of hazardous waste from generation to the disposal/recovery/recycling stage.

HPPCB needs to be strengthened in terms of manpower, equipment, instruments and other infrastructure facilities for effective enforcement of regulations. Central and State Governments should support HPPCB by periodically providing adequate funding, training and sponsoring awareness programmes.

Small and medium scale mines and artisanal mines dominate, especially in the minor mineral sector which are of less than five hectares in size and which do not fall within the purview of EIA Notification, 2006 but are required to take environmental clearance as per MoEF office Memorandum No. L-11011/47/2011-I A II (M) dt: 18.05.2012.

Inventory of such mines that operate without prior environmental and social assessment and appraisal by appropriate authorities needs to be prepared.

Control and Management of Industrial Pollution: In regulating the Air (Prevention and Control of Pollution) Act, 1981 for control and abatement of air pollution, provisions related to consent in Section-21 of the said Act are most significant as the consent and its conditions are the foremost means for prevention, abatement and control of pollution. This is ensured in the following manner: 'Consent to Establish' is granted to the industry after evaluation of potential air pollution and after the examination of the engineering design and details of the systems proposed for controlling the air pollution. The conditions consistent to air pollution control requirements are incorporated in 'Consent to Establish'. These conditions are reviewed in terms of their compliance and 'Consent to Establish' is converted into 'Consent to Operate' after ensuring that the engineering systems for control of air pollution are fully implemented.

Energy conservation should be done by Industrial Consumers by lubricating motors and motor drives regularly; placing motor as close to the load as possible; not using oversized motors, which waste energy and increase demand charges; using shunt capacitors across motor terminals to reduce demand charges; and also to avoid damage to motors and tighten belt and pulley at regular intervals to reduce loss of energy due to 'Slip'.

Setting up of a sectoral clean Technology Centre dealing with mining, beneficiation, transportation, utilisation and waste disposal: In the pulp and paper manufacturing sector, several clean technologies, such as anaerobic treatment, lignin recovery, etc. can be adopted for pulp and paper production as the success of these efforts has been established with pilot plant tests. Other examples of clean technologies relate to use of lignin to develop value added products, use of fly ash generated during burning of lignin for brick-making and reduction in raw material consumption.

7.7 Energy

River Basin Plans and Energy Master Plans (consisting of generation / transmission / distribution) should be prepared as the first step in order to optimise energy sector development in harmony with river basin plans. The River Basin Plan should include basin level 'Strategic Environmental Assessment' (SEA) and determination of the carrying capacity of the basin in the context of competing water requirements. This should also include mapping of catchments and surveying and assessing land use patterns with emphasis on drainage, vegetation cover, silting, encroachment, human settlements and human activities and its impact on catchments and water bodies. SEA should identify 'alternatives', which could be implemented at policy, plan and project levels. However, accord of environment and forest clearance may be allowed to continue simultaneously with the formulation of the basin level plan(s).

River basin plans should specifically focus on 'determination of flow' on rivers and tributaries, which will assist in determining 'ecological flow' versus 'available flow' along the main stream and tributaries. River basin plans should also focus on 'zonation' of the basin, e.g., delineation of eco-sensitive zones based on 'carrying capacity' concept.

Construction of dams, barrages, canals etc. for development should keep in view the potential for ecological requirements and maintain adequate flow in the rivers for the breeding and conservation of fish, especially indigenous species. The determination of the ecological flow in the context of each of the development intervention should be fixed based on river basin plan and the carrying capacity determination. Further, a mechanism should be devised to maintain this minimum flow all the year round to maintain the ecology of the river.

Further, detailed Environmental Impact Assessment (EIA) should be carried out with basin plan serving as guidance document for

each of the proposed projects before their implementation, which might have negative impacts on aquatic habitats. Regular monitoring of EIA and EMP should be carried out to monitor their efficiency.

Dam and reservoir fisheries should be closed for about two months, during the rainy season, to safeguard pre spawning and spent fishes.

Fish sanctuaries should be established in consultation with experts from the State Fisheries Departments and local people, particularly those inhabiting the river basin and depending upon the fishery resources. Deep pools in rivers should be designated as sanctuaries.

Rules should be formulated to control the introduction of exotic species and diseased fishes. The enforcement of rules and the protection of river fisheries require the creation of a river police force under the Fisheries Departments, provided with necessary equipments, including motor boats.

Factory effluents should be treated by appropriate physical, chemical or biological methods before discharge into rivers or reservoirs. Discharges from sewage treatment plants should comply with the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and subsequent amendments.

There should be frequent monitoring of water bodies to assess whether water quality is suitable for healthy fish and other aquatic biota.

Deforestation should be prevented close to rivers and their tributaries, on reservoir catchments and in other environmentally sensitive areas, so as to check soil erosion. For this purpose, the Forest (Conservation) Act, 1980 should be strictly applied. Large-scale afforestation of catchment areas should be carried out to rejuvenate springs and streams.

Whenever possible, pesticides and agricultural wastes should be properly treated before their discharge into water bodies. An integrated pest management approach is recommended involving bio-regulation for prevention of pollution and maintenance of proper biological balance.

Specific conservation measures have been proposed for wetlands designated at Ramsar sites in Himachal Pradesh. For Pong dam lake, three types of measures are proposed: to manage the habitat; to co-exist with the local community and eco-tourism.

To co-exist with the local community: Efforts to conserve forests and wildlife have gradually begun to shift away from law enforcement and use restrictions during the last two decades, and towards more participatory approaches emphasising equitable and sustainable use of natural resources by local people. This change in approach is particularly important in rural areas of the Pong Dam Bird Sanctuary, where biodiversity is concentrated and where poverty tends to be pervasive.

Prepare strategies and action programmes for Community Awareness and Mobilization (CAM) and Conservation Education (CE) in the villages situated in the catchment area of wetland/reservoir/water body. The National Literacy Mission is active in the Pong Dam sanctuary area, which can become conservation-oriented through proper planning. The catalytic force to do such a job is involvement of local wisdom in nature conservation through formal and informal nature education programmes. Proper publicity of the biological, ethnic and social aspects of the sanctuary can attract a number of educational institutions and donor agencies to contribute to the cause of conservation of such values.

Develop wetland/reservoirs/water body related infrastructure as per area specific master plan/management plan/basin plan. These master plans should be based on zonation land use and expected population pressure. Water supply, sewage, Municipal Solid Waste, traffic and transportation should be essential component of these master plans.

All the sectoral recommendations related to project and programme implementation should be implemented in the State. All the proposed actions related to response in terms of projects, programme and plans identified and highlighted in Table 39 should be implemented.

An interdisciplinary advisory committee should be formed at State level to advise the State Government on hydropower development and coordinate with the Central Government ministries, like MoEF/Ministry of Power. This advisory committee should consist of eminent experts, like basin planners / hydrologists / environmentalists / ecologists / socio-economic experts, etc. The committee should provide guidance to the State based on the basin plans as well as coordinate with MoEF/other line Ministries of the Government of India to arrive at sustainable hydropower development solutions in the State in the context of managing ecological flow and the need of the State to meet electricity deficit during the lean season as well as for future. Inter-Departmental co-ordination between different Departments like hydroelectric utilities, Department of fisheries, Forests and wildlife, Department of Tourism and Civil Aviation, Tourism Development Council, ULBs, PWD, IPH, BBMB, SJVNL, Transport, Himurja, DEST, HPPCB, PRIs, Public Relations, Tourism Unit Operators, NGOs, CSOs is needed for effective planning, implementation and monitoring of programmes.

Power Producer's Forums for all river basins in Himachal Pradesh may be constituted on the lines of the Hydropower Producers Forum (HPPF) for river Satluj. A member from the respective Power Producer's Forums may also be included in the committee so as to address the need of striking a balance between hydropower development needs of the nation and the conservation of the environment and ecology of the State of Himachal Pradesh.

Establish a system of data collection and analysis of statistics related to monitoring indicators pertaining to the sector in the State. Monitoring data should be compiled and updated regularly. It should be linked to district level information system in the State so that area specific plans, programmes and projects can be monitored and information can be accessed.

Mass awareness programmes to be planned. Utilising the Information, Education & Communication technology to reach masses will go a long way in protecting the functioning of the fragile ecosystem. Further, outreach programme should be a component of aquatic ecosystem restoration programmes, e.g., Lake Association and citizen monitoring groups have proved helpful in educating the general public and effort should be made to ensure that such groups have accurate information about the causes of lake degradation and various restoration methods. The role of NGOs in protecting and preserving lakes/water bodies and disseminating the importance of ecology and environment should be recognised and promoted.

7.8 Market Infrastructure

In promoting Private Sector marketing systems, the Government needs to examine existing policies, rules and regulations with a view to minimising conflict in successful Private Sector operations.

Inter-Departmental co-ordination between different Departments, like Horticulture, Agriculture, Transportation, PWD, HPMC, State Agriculture Marketing Board, Environment, Science and Technology, NGOs, CSOs is needed for effective planning, implementation and monitoring of market infrastructure intervention programmes.

A review is required in respect of all laws, which regulate participation in the market, such as registration/licensing, commodities traded, controls on packaging and labelling, laws affecting market place, laws affecting supply including controls on movement of produce and volume of commodities traded.

Encourage farmers to undertake grading of farm produce at the farm gate, thus enabling farmers to improve price realisation considerably with the help of direct marketing, which enables farmers to meet the specific requirements of wholesalers from the farmers' inventory of graded produce and of retail consumers based on consumers' preferences, thus enabling farmers to dynamically take advantage of favourable prices and improve their net margin.

Direct marketing by farmers' organisations needs to be promoted in the light of continued criticism that both farmers and consumers suffer economic losses in the existing agricultural marketing system/structure.

A similar logic holds good for consumer organisations also, who can procure directly from producers and distribute the same to the consumers commensurate with their purchasing powers.

The Government should support these organisations with schemes like providing back end subsidy for refrigerated as well as general transport; setting up of grading and packing houses; credit at low interest, etc., till they become financially self-sufficient on commercial lines; and development of communication links.

Direct marketing to wholesalers and agro-industrial processors presupposes prior knowledge of buyers' needs among farmers and presupposes prior knowledge of the capability of farmers among wholesalers and agro-industrial processors. Such prior knowledge cuts costs related to the gathering and assimilation of needs and capabilities. Such knowledge also has a favourable impact on the exchange of goods and payments thereof.

Introduction of programmes for the creation of infrastructure for Research and Development, extension, post harvest management including processing and providing production support services and incentives to the farmers for all round development of the horticulture industry of Himachal Pradesh.

7.9 Rural Planning

Himachal Pradesh is a State where 90 percent of the population live in rural areas and almost 70 percent depend on agriculture, which contributes only 23 percent to the Gross State Domestic Product. No development can be successful if it is not built on the foundation of the rural sector. In view of this, there is urgent need for giving high priority to rural development, taking into account the following recommendations.

- Ensure effective dissemination of information, education and communication materials and impart training to the elected representatives of the PRIs for good governance and management for overall rural development.
- Besides the elected representatives, Government officials working with the PRIs too need to be trained. Though the Government, Non-Government Organisations and civil society groups are imparting such training, yet there is need for joint training so that the impact is more effective and transparent.
- Ensure co-ordination between *Panchayats*, Government and NGOs to upgrade the skills of the rural people and improve the quality of their life by establishing rural enterprises catering to their skills and needs.
- Maintain and upgrade the existing rural infrastructure and promote facilities, such as cold chains, marketing intelligence network to facilitate the agro-processing industries.
- The Government of India in certain cases provides funds for the development of rural areas through the NGOs, whereas the PRIs, being the real representative bodies of the people, are not treated as NGOs. The Government of India should abandon this approach and provide funds from all agencies, including international funding, to the PRIs.

- The State Government is in the process of adopting the central pattern of devolution of functions, functionaries and funds in respect of 29 items. The Government of India is also required to devolve to the PRIs similar functions in respect of schemes implemented by various ministries of the Government of India in the rural areas.
- To discourage over dependence on funds from outside, the PRIs should be encouraged and empowered to mobilise their physical and human resources.
- Special efforts should be made to promote and facilitate a network of elected women representatives. Intra-state and inter-state exposure visits of women representatives of PRIs need to be encouraged.
- Agricultural reforms are a key element for improving the economic condition of the small and marginal farmers. The involvement of PRIs in this process has a great scope.
- For better implementation of poverty alleviation programmes, there is need for effective co-ordination between the officials of various Departments and the PRIs.
- *Gram Panchayats* should be encouraged to involve themselves actively in planning, implementing, monitoring and evaluating the poverty alleviation programmes for better results.
- All poverty alleviati on programmes at the village level should be put at the disposal of the *Gram Panchayat* and implemented with the help and cooperation of the local-level bureaucracy. Further, the *Gram Panchayats* should be selective in this regard and take into account the needs of the people and the scope of real employment generation, before taking up the programmes for implementation.
- For proper identification of the BPL families, the role of the NGOs, *Panchayats* and the community must be ensured.
- An appropriate institutional and organisational structure is a prerequisite for the success of a rural development programme. Appropriate technology skills, equitable access to production inputs, services and credit are other prerequisites for the success of a production-oriented programme: A producer owned and controlled integrated system of production, procurement, processing and marketing is necessary to derive full benefits from the backward and forward linkages of these activities.
- Although, the Government has been and will continue to be the most important actor in rural development, it alone cannot effectively tackle all problems. The PRIs, co-operatives, voluntary agencies and the Private Sector can play an important role in the process of development by complementing and supplementing the functions and activities of the Government.
- Proper training of officials/non officials at the district and block levels is to be ensured. There is also a need to strengthen the field functionaries at all levels. This calls for strengthening the existing training institutions and identifying certain other institutions where these functionaries may be imparted training about the implementation of anti-poverty employment generation and other social welfare programmes.
- In order to make the elected representatives of PRIs aware about the different schemes/programmes/policies of the State and Central Government, it is necessary to organise *Panchayat Sammelans* from time to time. Since elections have been held, *Sammelans* for the office bearers are to be organised. These *Sammelans* will be a regular feature so as to communicate new initiatives to the PRIs.
- The training Institutes are located in Mashobra, district Shimla and Baijnath in district Kangra for the purpose of imparting training to the elected representatives of PRIs/Employees of the Rural Development and *Panchayati Raj* Departments. The training institute at Baijnath being old requires reconstruction.
- All the sectoral recommendations related to project and programme implementation for the sector should be implemented both in

rural and urban areas. All the proposed actions related to response in terms of projects, programme and plans identified and highlighted in Table 43 should be implemented.

- For efficient and smooth functioning of the sector, adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

7.10 Urban Planning

Vulnerability Assessment - as part of Environment Master Plan- has been carried out at *tehsil* and district (geographical level) and sectoral levels.

As part of the Vulnerability Assessment, following attributes have been selected, which have direct implications for prospective town and country planning and urban development:

- Gaps in potable water supply, sewerage and Municipal solid waste collection and treatment;
- Existing basic civic amenities and social infrastructure facilities;
- Existing industries at *tehsil* and district levels;
- Present and projected population, population density and correlation with basic civic amenities and social infrastructures;
- Literacy, health, livelihoods etc.

The Vulnerability Assessment (VA) based on the above said attributes for determining vulnerability can be integrated with Town and Country Planning and Urban Development. The towns/*tehsils* can be prioritised for action by UD/TCP based on the Vulnerability Indices thus arrived. The perspective planning by TCP/UD can factor in Vulnerabiligy Assessment in town development plans/sector plans as well.

Sustainable urban planning should aim at achieving social and environmental equity while improving the lives of the people. Thus, in order for a city or urban area to be sustainable, it needs to produce and manage basic services, like water, waste, energy, and transportation in a way that conforms to the principles of sustainable development. In other words, the city should be able to produce and distribute the services in an economic, environment friendly and equitable way. Cities/towns do not adequately provide basic services that pollute the environment. In general, urban infrastructure systems are not adequately designed without much attention to environmental and social impacts. Mostly, the delivery of services, like water, energy, waste, transportation etc. is based on non-renewable energy sources. Moreover, the inequality in the provision of these services is very high.

For the urbanisation policy to be more inclusive and have a real bottom-up approach, there has to be an increased element of community participation that articulates citizens' voices. However, for this to happen, a workable mechanism of participation needs to be developed.

The urbanisation policy needs to be reflexive. International experiences suggest the need to move beyond detailed and rigid Master Plans, as they are static while cities are organic and constantly evolving.

The Centre should prescribe a macro framework and let the State Government customise solutions according to ground realities.

National schemes, such as *Rajiv Awaas Yojana* (RAY) should be rolled out nationally only after having viable pilot project and generalising from particulars.

Processes and plans of urbanisation should be citizen-centric and inclusive of all sections of the society including urban poor; comprehensive; should have the ability to create convergence; have continuity; be relevant to the context, involve conversations

with stakeholders and have connections with other relevant policies.

Develop and propagate innovative ways of Municipal financing through Public-Private Partnerships (PPPs).

Need for training and capacity building for urban planning and urban services management for Corporators and Municipal officials.

Reform of JNNRUM and convergence with RAY for an integrated approach. Amend the National Urban Transport Policy (NUTP) by introducing elements, such as demand management, rational transport pricing and clear definition of the role of Urban Mass Transport Authority.

Improve the JNNURM scheme by improving its Monitoring and Verification mechanisms to ensure that projects are NUTP-compliant, model shares of public and non-motorised transport are actually improving in cities and infrastructure is friendly for non-motorised transport.

Incentivise bus operations in cities by providing capital subsidy and reimbursing taxes and duties paid on fuel.

Introducing fuel efficiency norms for automobiles is another approach to address the twin problems of energy security and increasing emissions from transport. This can be achieved by the following:

Attempt labelling individual vehicles on a kmpl basis to enable consumers to make a rational choice. This could be accompanied by either a star rating or a mention of the worst and best fuel efficiencies in that vehicle class.

Introduce labelling that is based on a continuous function of weight and fuel efficiency.

Attempt fuel efficiency by imposing periodically tightened corporate fleet efficiency standards with mechanisms to penalise non-conformance. These norms can be Green House Gas based, and efficiency achievements may be traded.

Given differential fuel efficiencies and fuel taxation, if the Government desires, it could consider imposing an up-front tax on personal vehicles to absorb the benefits accruing from differential taxation while passing on fuel efficiency benefits to the consumers. However, some members of the group felt that such an up-front tax would be unfair to the manufacturers as up-front costs are an important determinant in vehicle choice. It may be better to simply get rid of the relative distortions in fuel pricing by letting petrol and diesel be priced on the same footing, and let fuel efficiency and technology govern the choice of vehicle for the consumers.

The norms can initially be defined by Bureau of Energy Efficiency (BEE) or Ministry of Road Transport and Highways (MoRTH) and implemented by MoRTH for cars, and can then be extended to other vehicles, such as trucks, buses and two-wheelers.

Attempt implementation of Energy Conservation Building Code and Green Buildings Rating System for both new and existing buildings. These will save electricity consumption over and above what can be saved by energy efficient appliances. It is important to ensure that a suitable code is evolved and integrated with statutory regulations at all levels of Government.

The Pollution Control Board of Himachal Pradesh, under a National programme called 'Monitoring of National Aquatic Resources' regularly assesses the quality of the water in the major rivers and their tributaries, covering 22 important parameters (SOER-HP). It has observed and recommended that:

- Frequent sampling should be done if river water is used for drinking and the water for drinking should be properly treated and disinfected.

- All towns on the banks of the rivers should be provided with sewage treatment facilities and should not be allowed to discharge urban waste without treatment into or on the banks of the river.
- A number of hotels and tourist resorts are coming up on the banks of the rivers. These must have proper sewage treatment plants.
- Industrial units should not be allowed to discharge untreated effluents into rivers/*khads*/*nallahs*.

These recommendations should be implemented by the State Government without any delay, as it is important to protect the ecology and the natural beauty of the State. The sewerage facility should be extended to all major towns. The treatment of sewage is necessary and urgent steps are required to be taken for the disposal of treated sewage in the rivers. In several towns, sewage water, after proper treatment, can be recycled for domestic use. Since sanitation is a Municipal function, it should be transferred to the ULBs along with the staff working in the urban areas for maintaining and augmenting the sewerage system. The cost of operation & maintenance of sewerage should be recovered progressively.

Technological upgradation and improved design can increase efficiency and rationalise consumption. Regularity in water supply could mean lower project cost and greater willingness of the consumers to pay. Differential treatment of water for different uses is recommended. Micro level system needs to be designed to recycle water at the household level. The supply should be metered to plug leakages.

It is recommended that the use of low-cost technologies is promoted besides unbundling of services to involve the Private Sector and proper packaging i.e., clubbing together water supply and drainage projects can reduce the project cost and improve its viability. Similarly, road development and storm water drain management can be clubbed with commercial development of the adjoining areas.

It is recommended that the cost of collection, treatment and disposal of solid waste be reduced through various mechanisms. Technological innovations to improve the reusability of the recycled waste will increase the returns and make the projects viable. Privatisation of as many operations as feasible will improve efficiency and reduce the cost. Further, following measures are also recommended:

- Greater attention should be given to segregation of different kinds of waste at the collection point to reduce the cost of disposal.
- Bio-degradable waste should be tackled locally to avoid storage and transportation over long distances.
- Wherever environmentally acceptable, disposal can be decentralised to reduce the transportation cost.
- Separate collection and disposal of toxic waste.
- Use of right technologies to improve the quality of processed waste.
- Landfills can be scientifically organised to minimise pollution.

It is recommended to install more incinerators for treating Bio-Medical Waste, at least one in each major district/town, to create a people-friendly environment in the cities of Himachal Pradesh.

It is recommended to prepare a 'Solid Waste Management Strategy' for urban areas to manage solid waste efficiently, in view of the ecological sensitivity and importance of this hilly State. The small and medium sized ULBs can have a common waste treatment facility, as the construction of a treatment plant in a *Nagar Panchayat* or even in a medium size Municipal Council will not be feasible or viable. Since Solid Waste Management in hills requires specific skills and technology due to difficult topography, climatic and environmental factors, the training/capacity building of staff is essential.

Pursue *dhaba* owners to adopt elements of hill architecture, like sloping roof, facade and arcade, so that their structures are in conformity with the surroundings and as envisaged in the regulations.

It is recommended that district-wise notifications may be issued after identifying the urban corridors and active strips emerging in the State due to haphazard and unregulated construction activity along the highways. The Government may extend the Town and Country Planning Act, 1977, to include 25 30 metre wide strips along the national highways and along the State Highways (on both sides) to combat this trend.

It is recommended to constitute special areas and other authorities under the Chairmanship of Deputy Commissioners, so that the provisions of this notification can be enforced strictly. After such potential areas, which are prone to ribbon development, are identified in each district, notification may be issued to freeze the land use along these Highways.

To enable standardised environmental norms to be uniformly applied to spatial plans, the Town and Country Planning Act, 1977 needs to be extended to all the urban centres of the State including all the 49 ULBs. It has been observed that large scale developments are taking place outside the Planning areas and Municipal Limits. These developments, in the form of Institute, Industries and large establishments, are required to be regulated by some Competent Authority having technical expertise. As *Panchayats* do not have technical support for according such approvals, extending the Town & Country Planning Act, 1977 would plug this regulatory gap.

The provisions of the Town and Country Planning Act, 1977 should be extended to all the Urban Centres of the State including all the ULBs and Cantonment Board Areas as well, in order to ensure planned and regulated development. The Extension of the Act to all the Urban Centres would be initiated by notifying the Planning Areas and then move further as per the provisions of the Act.

In accordance with the provisions of the Town and Country Planning Act, 1977, Regions should be identified, delineated, and Regional Development Plans should be prepared, published and adopted. ***The Regional Plans have a potential to address all the State level pressure variables included in the Vulnerability Assessment and, thus, would dovetail the Planning Process with the Environment Master Plan.*** This would also help in addressing civic infrastructural gaps at the regional levels as a Regional landfill may be viable for serving solid waste management needs surrounding ULB's.

As a suggestion, the entire State could be divided into three main Regions, namely, the Foothills - Plains Region comprising of Sirmaur, Solan, Bilaspur, Hamirpur, Una and Kangra; the Mid Himalayan Region comprising of Shimla, Mandi, Chamba, Kullu and the High Himalayan region comprising of Lahaul and Spiti and Kinnaur. The publication and adoption of Regional Plans would also make the Town and Country Planning Department a major player in the Developmental Process and shall also justify the 'country' component of the Departments' names.

The Act also provides for the preparation of Sector Plans. The Development Plan basically is a broad based policy document, while the Sector Plans (called Zonal Plans in other States) are the actual working plans and the implementation document. In a scenario like Himachal Pradesh, due to smaller size of the Urban Centres, these Sector Plans can start functioning as an Action Plan giving impetus to planned development.

The clause in the Act stating that the Sector Plan is an enlargement of the provisions of the Development Plan should be amended to state that *"the Sector Plan is the working detail Plan within the broad framework of the Development Plan."* This is necessary as the Development Plan is on a city scale and not in a position to provide details like provision of local shopping centre, or a localised service centre or facility, which can be indicated in the Sector Plan.

The Act provides for Planning Tools in the form of Regional Plans, Development Plans, and Sector Plans. In light of the 74th Constitutional Amendment, the tasks of preparing Regional and Development Plans should remain the responsibility of the Town and Country Planning Department and the responsibility of preparing, publishing and implementing the Sector Plan should be handed over to the Urban Local Bodies. They would prepare, publish and implement the Sector Plans under the Provisions of the Town and Country Planning Act, 1977.

It has been observed that large developments are taking place outside the Planning areas and Municipal Limits. These developments in the form of Institutes, Industries and large establishments take approvals of the *Panchayats*, which do not have technical support. It is, thus, recommended that Provisions be made in the Land Revenue Code, under which diversion of land from agriculture to non agriculture purposes is made. These Provisions should state that the opinion of The Town and Country Planning Authority should be mandatorily taken and abided by before the diversion is made. This would regulate the unplanned spread of these establishments.

All the Planning tools, viz. Regional Plans, Development Plans and Sector Plans should be programmed to be prepared, published and adopted in a time bound manner.

Plan Implementation (Interface of Town and Country Planning and the Urban Local Bodies)

A Plan Implementation Mechanism should be developed, so that the Plans prepared are implemented on the ground. For this purpose, it is extremely necessary that the Town and Country Planning and the Urban Local Bodies are synchronised and are on the same page. It is recommended that after the adoption of the Plan, the Urban Local Body is declared as the Town and Country Development Authority for the Planning area of the Town. This would not only enable implementation of the Plan, but also enable the Urban Local Body to undertake schemes and regulate the development in the Planning Area. This would also ensure that the Urban Local Body accepts the ownership of the Development Plan.

For this purpose, the core competency of ULBs should be strengthened by providing adequate planning and technical staff comprising of Town Planners and Engineers to empower them for the preparation of Sector and Action Plans, etc. It will also enhance their technical capacity for according building permissions/planning permissions, such as approval of Layouts and dealing with unauthorised constructions for Planning Areas efficiently. The building norms in Development Plan regulations under Town & Country Planning Act, 1977 for planning areas and the Building Bye-Laws integral followed by the Urban Local Body often differ. This creates regulatory anomalies in areas that either overlap or are adjoining each other. Hence, building regulations in Development Plans of Town & Country Planning and the bye-laws of ULBs should be congruent to act as an effective check on deviations occurring due to duality of prevailing regulations.

The Development Regulations under a Development Plan or Sector Plan and the Building Bye-Laws followed by the Urban Local Bodies should be co-terminus and matching. At present, sometimes, they are divergent and this anomaly has to be removed.

A budgetary provision of seed capital for Land acquisition for Town Development Schemes should be made, so that funds are available to the Authority for schemes initially. On completion of the schemes, which would entail the recovery of the land cost, the ULBs should return the seed capital to the Department.

Urban Local Bodies (ULBs)

Urban Local Bodies are the key Institutions for ensuring a sustainable urban environment with a better quality of life. Thus, strengthening them is of immense importance and a priority. Though the ULBs have a defined

organisational structure, yet the manning of the formations is evidently inadequate, which results in deficient service delivery. It is, thus, recommended that the ULB structure should be reviewed, and the ULBs should be fully staffed and strengthened to face the challenges in times to come.

In light of the 74th Constitutional Amendment, the ULBs shall have to take up newer responsibilities, like the Water Supply, sewerage, etc. in phases. This can be achieved initially by sending the Technical cadre of the IPH which is handling these services, on deputation to the ULB. Along with these personnel, the budgetary support for their salaries and operations and maintenance as well as enhancement of the networks should be transferred from the IPH to the Urban Development Department.

One of the key issues, in fact, the most important issue confronting the Urban Local Bodies is their Revenue Generation and Management. It is observed that the Revenue generation in terms of House Tax, rents from ULB properties etc. is low. This has to be streamlined and enhanced. Some suggested actions are:

- The responsibility of recovering revenue should be fixed not only on the executive branch, but on the elected representatives too, who constitute the decision making body.
- At present no revenue is generated on account of services provided for street lighting, sanitation, sewerage, etc. A tax on these services, as practised in Madhya Pradesh (called *Samaikit Kar*) should be imposed and collected by the ULB. This tax should not be exempted for any one, including the Government Departments. The Government Departments can make a provision in their annual budget under the head of office establishment (the electricity bills, rent etc. are paid under this head).
- Powers for imposition of collection fee, levy of tax, cess should be given to ULBs.
- Single Umbrella System as applicable in Shimla MC should be extended to all the ULBs.

In order to strengthen the ULB system, Regional Office of Urban Development Department should be established, so that the decision making process is decentralised and time is saved.

Nagarpalika Suvidha Kendra should be established at district level. The district headquarter ULB can be the nodal agency to mentor such *kendras* and the management of these *kendras* could be outsourced. Proposed *Nagar Palika Kendra* should have the mandate of providing facilities and services, such as, assessment of training needs and other Human Development issues. Such *kendras* may have two branches – Community Development Corporation (CDC) and Micro-business, which may be headed by female and male representatives, respectively. Community Development Corporation (CDC) may have the mandate of community based services by collecting community based information, while Micro-business may have the mandate of conducting household surveys, preparing profile of the households/communities etc.

7.11 Municipal Solid Waste

A paradigm shift is needed for a responsive approach to implement decentralised service delivery, from the top down to the bottom up approach and ultimately to change the roles of the Government from that of a service provider to a facilitator. In this context, sector reforms need to be implemented at faster pace. This calls for establishing necessary institutions and developing necessary competencies for internalisation of reform initiatives in the community. Involvement of three tiers of *Panchayati Raj* Institutions, social mobilisation, capacity development and communication processes are the core components of Total Sanitation Campaign (TSC) projects. A holistic reform process is required to be implemented at the State level. These may include: Full ownership of sanitation assets with appropriate levels of *Panchayats*; *Panchayats*/communities to

have the powers to plan, implement, operate, maintain and manage all sanitation schemes; 100 percent responsibility of operation and maintenance by users; an integrated service delivery mechanism; shifting the role of the Government from direct service delivery to that of planning, policy formulation, monitoring and evaluation and partial financial support.

The Municipal Solid Waste collection, treatment and disposal facility should be extended to all towns. The treatment of Municipal Solid Waste is necessary and urgent steps are required to be taken for the disposal. The cost of Operation & Maintenance of sanitation should be recovered progressively.

Municipal Solid Waste treatment must be strictly implemented for all sizes of urban centres. The smaller urban centres could use less decentralised and less capital intensive technologies to reduce capital cost as well as maintenance cost of treatment.

Recycling/reuse of Municipal Solid Waste is practiced in very few urban centres. Recycling/reusing waste should be adequately factored at the project design and operational stage so as to reduce the demand for fresh products and raw materials, e.g., chemical fertiliser, electricity, plastic paper etc.

Sanitation is not charged for all urban centres, therefore, cost recovery is generally very low from this service. Provision of sanitation fees should be made. All agencies dealing with sanitation must prepare plans for cost recovery from this service.

Pollution of land or water body with waste Municipal Solid Waste (MSW) should be made punishable with fine.

It is recommended that the use of low-cost technologies, the unbundling of services to involve the Private Sector and proper packaging, i.e., clubbing together water supply, sewerage and drainage projects can reduce the project cost and improve its viability.

Private Sector participation to be promoted to increase stakes in MSW management and to meet additional capital investment requirements.

Demand-driven, participatory approach should be adopted and village *Panchayat*/community shall be given the power to plan, implement and manage waste using integrated approach.

Capacity development of the community to plan, implement and manage the sanitation schemes of their own choice. Implement decentralisation of the services and handing it over to local Governments or PRIs.

Implement capacity building programmes, e.g., awareness generation amongst Himachal Pradesh population; training to Government personnel on environmental issues, their responsibilities, planning, implementation, monitoring and surveillance; other education and information dissemination forums.

Various mechanisms for information dissemination and awareness generation implementation could be achieved through existing programmes as well as through Departments whose activities impact the sector. NGOs, academic institutions and other State level communication units can be deployed for the purpose.

Mainstreaming of environmental and social issues in Municipal Solid Waste sector can be achieved by imparting training on implementing good management practices described in Section 4. These good management practices can be transformed into module level training programmes and imparted to line agencies based on their requirement. Further, it is recommended that designated officer in each line agency be trained so that he/she can act as trainer at all levels of planning and implementation.

Inter-departmental co-ordination between different Departments like Department of Forests & Wildlife, Department of Tourism, Tourism Development Council, ULBs/Municipalities, IPH, Department of

Urban Development, PWD, Transportation, Himurja, DEST, HPPCB, PRIs, Public Relations, Tourism Unit Operators, NGOs, CSOs is needed for effective planning, implementation and monitoring of waste (MSW) management programme.

All sectoral actions/activities related to project and programme implementation for sanitation, waste management should be implemented both in rural and urban areas. All the proposed actions related to response in terms of projects, programme and plans identified and highlighted in Table 46 should be implemented.

For efficient and smooth functioning of sanitation/waste management sector, adequate monitoring and supervision is necessary. The performance of various indicators would improve to a large extent if there is regular monitoring and supervision. All the monitoring and reporting programmes identified in proposed actions should be implemented in a time bound manner.

7.12 Hazardous Waste

Private Sector participation to be promoted to increase stakes in Hazardous Waste management and to meet additional capital investment requirements.

Mainstreaming of environmental and social issues in Hazardous Waste sector can be achieved by imparting training on implementing good management practices described in Section 4. These good management practices can be transformed into module level training programmes and imparted to line agencies based on their requirements. Further, it is recommended that the designated officer in each line agency should be trained so that he/she can act as trainer at all levels of planning and implementation.

Pollution loads are similarly linked to pricing policies leading to inefficient use of agricultural chemicals, and Municipal and industrial water use. In particular, revenue yields for the latter two are insufficient to install and maintain sewage and effluent treatment plants, respectively. Pollution regulation for industries is typically not based on formal spatial planning to facilitate clustering of industries to realise scale economies in effluent treatment, resulting in relatively high costs of effluent treatment, and consequent increased incentives for non-compliance. Industrial areas are primarily being created to encourage setting up of industries in such areas so as the adhere to some degree of formal spatial planning facilitating clustering of scale for setting up of basic infrastructure for effluent treatment, hazardous waste management, sewerage treatment etc. In Himachal Pradesh, due to geographical reasons and terrain, the size of industrial areas is relatively small. In areas where there has been growth of industry around the industrial areas created by the Department, the State is providing land at very nominal cost to the Special Purpose Vehicles being promoted together with the stakeholders for setting up of these facilities in some industrial areas. In order to make such ventures viable, there has to be a minimum number of units located in these areas so as to make such activities viable. The regulatory mechanism is administered by the Himachal Pradesh Pollution Control Board, whereas the pricing policies have been left largely to these Special Purpose Vehicles, which consists of the stakeholders and have been created to provide these services to the industry. This model would be replicated in other industrial areas in a phased manner once the minimum number of units comes up in a particular industrial area. There is, accordingly, need to review the relevant pricing policy regimes and regulatory mechanisms, in terms of their likely adverse environmental impacts.

Consider and mitigate the impacts on river's flora and fauna, and the resulting change in the resource base for livelihoods, of multipurpose river valley projects, power plants, and industries. Department of Industries can factor this aspect while deciding or approving a location for siting of a major industry or an industrial area. Hence, this aspect need to be incorporated while formulating guidelines for

siting of industry so that both Entrepreneurs and Authorities in the Government are aware of which factor to consider while identifying land for their project.

Prepare and implement action plans for major cities for addressing water pollution, comprising regulatory systems relying on an appropriate combination of fiats and incentive based instruments, projects implemented through public agencies as well as Public-Private Partnerships for treatment, reuse and recycle where applicable, of sewage and wastewater from Municipal and industrial sources, before final discharge to water bodies.

A hazardous waste management facility has been created in the State in PPP mode, which is operational. It is at a stage of infancy and facing some teething problems largely related to pricing of services and scale of operation. Perhaps, it may require some statutory backing to ensure that the established industries use this facility and the extent of its usage needs to be audited and monitored by the Himachal Pradesh Pollution Control Board before extending permissions to units to operate.

Further, in view of the above, survey and develop an inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacities of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes.

Further, in view of the above, strengthen the legal arrangements and response measures for addressing emergencies arising out of transportation, handling and disposal of hazardous wastes, as part of the chemical accidents regime.

Give legal recognition to, and strengthen the informal sector systems of collection and recycling of various materials. In particular, enhance their access to institutional finance and relevant technologies.

Promote biodegradable and recyclable substitutes for non-biodegradable materials, and develop and implement strategies for their recycle, reuse, and final environmentally benign disposal, including through promotion of relevant technologies, and use of incentive based instruments. This involves identification of appropriate technologies and processes for processing and disposal of such products. It, therefore, requires substantial R&D inputs at the Central Government/Central Government funded institution levels, which should share their experiences and knowledge with the State Government so that they may advise and encourage promotion of specific products and technologies for this purpose.

Develop and enforce regulations and guidelines for management of e-waste, as part of the hazardous waste regime.

Promote, through incentives, removal of barriers and regulations, the beneficial utilisation of generally non-hazardous waste streams, such as fly ash, bottom ash, red mud, and slag in cement and brick making, and building railway and highway embankments. Certain performance based incentives, like transport and interest subsidies may be provided to such units.

Develop and promote the use of standardised environmental accounting practices and norms in preparation of statutory financial statements for large industrial enterprises, in order to encourage greater environmental responsibility in investment decision-making, management practices, and public scrutiny. This may be done by making it a statutory requirement under the Companies Act by the Central Government.

Waste generation is a dynamic phenomenon depending upon change in products, processes, capacity of production and establishment of new industries. Hence, there is a need to periodically update the national inventory on hazardous waste generation, so as to facilitate decision making procedures with respect to strategies of hazardous waste management.

Waste minimisation, waste reduction and waste reuse needs to be attempted first to avoid

waste accumulation. Dissemination of information on technological options to be a continuing exercise.

Clean technology norms for each industry should be defined so that less hazardous waste is generated and hence pollution caused is also reduced.

Possibilities must be explored with industrial associations/industries for options of reusing, recovering and recycling hazardous waste in an environmentally sound manner.

Payback schemes should be introduced as a part of extended corporate responsibility in case of lead-acid batteries.

A system should be developed for channelising wastes containing toxic metals for recovery, such as mercury from thermometers and fluorescent tube lights, cadmium from batteries etc.

Waste exchange Banks/Centres should be established to provide information on wastes and promote reuse, recovery and recycling technologies, which upscale the quality of resource recovery.

Technological aspects need to be promoted so as to conserve the fuel as well as encourage the utilisation of waste as resource.

The Treatment, Storage and Disposal Facility need to cater to meticulously delineated hazardous waste catchment areas taking into consideration their distances from the generators and availability of wastes. State Pollution Control Board could ensure that in a given hazardous waste catchment area, no multiple operating Treatment, Storage and Disposal Facility exist to help maintain viability of the facilities.

Treatment, Storage and Disposal Facility need to be rigorously evaluated by the Himachal Pradesh Pollution Control Board periodically to ensure operation in an environmentally safe manner in compliance with the various provisions of regulations.

All Treatment, Storage and Disposal Facility operators should be asked to implement the provisions of Escrow Account as per the directive of MoEF to ensure that a separate Escrow fund is created for post closure monitoring and to deal with liability arising due to mishaps, calamities, etc.

Surveillance of industries by HPPCB and industry associations should be stepped up to take care of illegal dumping.

Remediation strategy needs to focus on the 'Polluter Pays' principle with the polluter being asked to pay penalty as well as costs of cleaning up the pollution. Industries causing pollution repeatedly should be blacklisted. Where polluters are not traceable, a dedicated fund needs to be created by SPCB/PCC for remediation.

Harmonisation of Export- Import regulations with the provision of the Rules, training of Custom Department personnel engaged in inspection and sampling and also up-gradation of Customs Department laboratories should be carried out to prevent illegal imports of hazardous waste.

The issue of inter-State movement of hazardous waste should be addressed in a rational way.

In order to deal with inter-State transportation as well as disposal of hazardous wastes in a facility, the following options should be considered: to have these processed wherever possible by the industry which supplied them; to appropriately incinerate either through dedicated incinerators of individual industries or through incinerators available with common facilities such as Treatment, Storage and Disposal Facility (TSDFs).

Adequate safety systems and procedures must be adopted during dismantling of ships and handling of hazardous wastes/materials (such as used oil, waste oil, asbestos containing panels/tiles, damaged asbestos containing material, paint chips, and used chemicals, like acids etc.).

HPPCB needs to develop on-line tracking system for movement of hazardous waste from generation to the disposal/recovery/recycling stage.

HPPCB needs to be strengthened in terms of manpower, equipment, instruments and other infrastructure facilities for effective enforcement of regulations. Central and State Governments should support HPPCB by periodically providing adequate funding, training and sponsoring awareness programmes.

Small and medium scale mines and artisanal mines dominate, especially in the minor mineral sector. These are of less than five hectares in size and do not fall within the purview of EIA Notification, 2006 but are required to take environmental clearance as per MoEF office Memorandum No. L – 11011/47/2011 – IA. II (M) dt: 18-05-2012. Inventory of such mines that operate without prior environmental and social assessment and appraisal by appropriate authorities needs to be prepared.

Control and Management of Industrial Pollution**:** In regulating the Air (Prevention and Control of Pollution) Act, 1981 for control and abatement of air pollution, provisions related to consent in Section 21 of the said Act are most significant as the consent and its conditions are the foremost means for prevention, abatement and control of pollution. This is ensured in the following manner: 'Consent to Establish' is granted to the industry after evaluation of the potential air pollution and after the examination of the engineering design and details of the systems proposed for controlling the air pollution. The conditions consistent to air pollution control requirements are incorporated in Consent to Establish. These conditions are reviewed in terms of their compliance and 'Consent to Establish' is converted to 'Consent to Operate' after ensuring that the engineering systems for control of air pollution are fully implemented.

Set up a sectoral Clean Technology Centre dealing with mining, beneficiation, transportation, utilisation and waste disposal. In the pulp and paper manufacturing sector, several clean technologies, such as anaerobic treatment, lignin recovery, etc. can be adopted for pulp and paper production as the success of these efforts has been established with pilot plant tests. Other examples of clean technologies relate to use of lignin to develop value added products, use of fly ash generated during burning of lignin for brick-making, and reduction in raw material consumption.

National Environment Policy (NEP), 2006 recommends the creation of a National Environment Restoration Fund from the net proceeds of economic instruments, user fees for access to specified natural resources, and voluntary contributions. The Fund may be used for restoration of environmental resources, including cleaning-up of toxic and hazardous waste legacies.

NEP recommends development and implementation of viable models of Public Private Partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of toxic and hazardous waste, both industrial and biomedical, on payment by users, taking the concerns of local communities into account. The concerned local communities and State Governments must have clear entitlements to specified benefits from hosting such sites, if access is given to non-local users. Develop and implement strategies for cleaning up toxic and hazardous waste dump legacies, in particular in industrial areas, and abandoned mines, and reclamation of such lands for future sustainable use.

NEP recommends survey and development of a State inventory of toxic (Mercury) and hazardous waste dumps and an online monitoring system for movement of hazardous wastes. Strengthen capacities of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes.

NEP recommends strengthening the legal arrangements and response measures for addressing emergencies arising out of transportation, handling and disposal of hazardous wastes, as part of the chemical accidents regime.

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