

## CAPACITY DEVELOPMENT PACKAGE (CDP)

2022



## Trainer's Manual

Capacity Development on Climate Change  
Adaptation for PRI (Panchayati Raj Institutions)  
Members in Himachal Pradesh

*Prepared under "Climate Adaptation and Finance in Rural India (CAFRI)"  
Supported by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)*

## **Imprint**

Published by

Department of Environment, Science and Technology  
Paryavaran Bhawan, Near US Club, Shimla  
Himachal Pradesh-171001

Phone No. +91-177-2656559

Fax No. +91-177-2659609

## **With technical support from**

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

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Mensa Design Pvt. Ltd.



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**Chief Minister**  
**Himachal Pradesh**  
**Shimla-171002**



**Jai Ram Thakur**

## **Message**

The major threat we face today is due to unwarranted impacts of climate change. It is extraordinarily critical, and therefore requires utmost commitment both legally & politically. Natural disasters are getting more intense and common, with terrible consequences. Droughts' devastation in many parts of the world are all visible that poses a severe threat to humanity. The declaration of India's Nationally Determined Contributions in 2021 demonstrates India's commitment and credibility.

Climate change is affecting the Himalayas more than almost any region in the world and it has already made the mountain communities in of Himalayan Region very vulnerable. During the last three decades most weather stations in Himachal Pradesh have reported increasing trend of temperature and as a result the rainfall as well as snowfall is becoming erratic.

Himachal Pradesh is one of the thirteen mountain states in the Western Himalayas, blessed with beautiful landscape, with peaks and extensive riverine systems. More than 70 million people who practice hill agriculture and whose vulnerability is expected to increase on account of climate change within the Himalayan eco system. In Himachal Pradesh also the erratic and changing weather pattern have affected sustainability of marginal rural community's agriculture and horticulture with average holding size is 1.07 ha. In our State also more than 70% of the population depends upon these two sectors for their livelihood.

Building capacities & skills of the most vulnerable communities/ target groups in the state is the key enabler for climate change adaptation. Capacity development for Adapting to changing climatic patterns is also critical to sustain the ecological balance in the social and environmental life. Government of H.P. has always been committed in addressing the local level needs & priorities of the most vulnerable population/ communities.

I am happy to learn that the climate change Capacity Development Package (CDP) for Mahila Mandals & PRIs in both English & Hindi language have been prepared by Department of Environment, Science & Technology, HP with the technical support extended by GIZ under Indo-German Technical Cooperation with the Ministry of Environment, Forest & Climate Change (MoEFCC), GoI. I am confident that this training material will be very useful for the farmers in the state. This training material will help them to understand climate change impacts & manage climate change risks in agriculture, horticulture, forests & water and how to conserve natural resources.

  
(Jai Ram Thakur)





**Ram Subhag Singh, IAS**

## **MESSAGE**

Climate change is a multifaceted phenomenon influenced by numerous factors. There are various scientific findings which reveals that the intensity of changing climate is directly proportional to anthropogenic activities/ developing activities. India is committed towards achieving net zero emissions by 2070 following ways of inclusive and resilient economic development. One of the critical points to address is our ability to reduce emissions through global coordination. A better understanding of climate risk and critical triggering points may be advantageous, intensifying the sense of urgency and pushing faster action.


IPCC's most recent scientific assessment reveals changes in the Earth's climate in every region and across the whole climate system. According to the report, the role of human influence on the climate scenario is irrefutable at this stage. It also indicates that human actions still have the potential to determine the future course of climate scenario, pointing to robust & sustained reductions in emissions of carbon dioxide and other greenhouse gases to limit the adversities of changing climate.

Over 90 percent of the land holdings in the state are of marginal and rural farmers. The state's economy is largely dependent on the agriculture/ horticulture activities. More than 90 percent of these activities are rainfed dependent. Any alteration in rainfall patterns has the potential to affect the entire economy of the state.

Himachal Pradesh state is proactively working to support linking of priority local adaptation needs to agencies and programs through strengthened intermediary organizations (community-based and self-help groups, gram panchayats, Farmer Producer Organizations (FPO) and associations, with special attention to women's self-help groups and women-FPO and their associations through various initiatives.

In order to reduce the vulnerability and increase the community's resilience a comprehensive capacity development package-cum-toolkit has been developed by Environment Department with the technical support of GIZ addressing local adaptation needs. The developed capacity development manual focuses on the priorities w.r.t climate change adaptation & mitigation of the target groups; Mahila Mandals, PRI representatives, women Self-help groups etc. The package will facilitate the State's Training Institutes; HP Institute for Public Administration (HIPA), State Institute for Rural Development (SIRD) & Panchayati Raj Training Institute (PRTI) to provide an overall understanding on climate change and its impacts on life & livelihood of rural communities, especially vulnerable communities, in different agro-climatic conditions in the state.

I extend my best wishes to the team of Department of Environment, Science & Technology, Faculty from HIPA/SIRD & PRTI & GIZ experts for this endeavour.

  
**(Ram Subhag Singh)**





**Prabodh Saxena, IAS**

## **MESSAGE**

Global climate crises, the world facing today are unprecedented. This changing climate has appalling implications on each and every part of the world. With increasing intensity of extreme weather events, viz; erratic rainfall, natural disasters, Economic losses, food, and water insecurity causing severe impacts on country's economic as well as social development. The rising temperature, untimely rains affecting Himalayan regions the most in different ways.

State of Himachal Pradesh is particularly vulnerable to rising temperatures and varying rainfall patterns because it is predominantly rural economy. For Himachal Pradesh the distress is higher because a large fraction of the population, approximately around 80 percent is residing in rural areas and dependent of rainfed agri-horti practices.

Only best possible way is to reorient the policies and programmes in a manner that the adaptation capacity is strongly built of all the sectors, strong commitment of social and political, policy and planner. Government of Himachal Pradesh is proactively working in the state to reduce climate change risks of vulnerable groups and sectors, build capacities of stakeholders (different levels) in the planning, implementation, and financing of climate adaptation initiatives at the State level.

We have prepared and adopted a Comprehensive State Climate Change Action Plan (SAPCC) 2021-2030 with clear cut vision to deal climate change risks. Taking a step forward in this direction, a Capacity Development Package-cum-Toolkit has been developed for the vulnerable target groups i.e., representatives of Panchayati Raj Institutions & members of Mahila Mandals, Women self-help groups in the State.

Department of Environment, Science & Technology is engaged with Himachal Pradesh Institute of Public Administration (HIPA), State Institute of Rural Development (SIRD) & Panchayati Raj Training Institutes (PRTI) on capacity development for Panchayati Raj Institutions (PRI) members and Mahila Mandals, SHGs for knowledge management on climate change adaptation at local level.

We acknowledge the technical support provided by German Development Cooperation (GIZ) as part of "Climate Adaptation & Finance in Rural India (CAFRI)" being implemented in the state under Indo-German Technical Cooperation between GIZ & Ministry of Environment, Forest & Climate Change (MoEFCC), GoI for this.

**(Prabodh Saxena)**



**Director**  
**Environment, Science & Technology**  
**Government Of Himachal Pradesh**



**Lalit Jain, IAS**

## **Foreword**

Climate Change, an impending devastating issue, is causing severe impacts on both rural & urban livelihood of the population. Anthropogenic activities are the primary cause of global warming leading to changing climate and changes in weather patterns over decades. Climate change has direct and significant impacts on our natural resources, socioeconomic activities, food security, health, and physical infrastructure. After signing of 'Paris Agreement' world leaders in 2016 resolved to limit rising temperature to 1.5°C, with a maximum of 2°C, by the year 2100. IPCC provides policymakers with regular scientific assessments on climate change, its implications, and potential future risks, as well as to put forward adaptation and mitigation options.

Extreme natural hazards and catastrophes are a major point of concern around the world, particularly in the Himalayan region. Severe climate impacts - droughts, flash floods, landslides, mass movements, debris-flow, and storms - have increased dramatically in recent years. Understanding & analysing historic climate research, computer projections can play an important role in building communities' resilience.

Being Himalayan state, Himachal Pradesh has been proactively working to sensitise local communities, most vulnerable communities, farmers to the adverse impacts of climate change. A Comprehensive State Action Plan on Climate Change (SAPCC) has been prepared by the department and continually working with stakeholders to implement various climate change adaptation programme in the state. As part of "Climate Adaptation & Finance in Rural India (CAFRI)" project being implemented in the state under Indo-German Technical Cooperation between GIZ (German Development Cooperation) & Ministry of Environment, Forest & Climate Change (MoEFCC), GoI, a detailed Capacity Development Package (CDP) has been prepared with the technical support of GIZ for the PRIs & Mahila Mandals.

To address the capacity need for adaptation at households, (and village) level leading to effective assessment, planning and implementation; this Capacity Development Package has been designed based on identified & prioritised local needs. Trainings with tools in CDP will facilitate PRIs for participatory decision-making process at local level for better resilience.

I am confident that the training package will certainly act as an important intervention in reducing climate vulnerability of rural areas. The efforts put in by the experts of GIZ, Department of Environment, Science & Technology & faculties of HIPA, SIRD & PRTI are highly appreciable.

  
**(Lalit Jain)**



# List of Abbreviations

<b>CAFRI</b>	Climate Adaptation and Finance in Rural India
<b>CCA</b>	Climate Change Adaptation
<b>CBOs</b>	Community Based Organisations
<b>CC</b>	Climate Change
<b>CCA</b>	Climate Change Adaptation
<b>DoE</b>	Directorate of Environment
<b>GEAG</b>	Gorakhpur Environmental Action Group
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>MGNREGA</b>	Mahatma Gandhi National Rural Employment Guarantee Act
<b>MKSP</b>	Mahila Kisan Sashaktikaran Programme
<b>GPDP</b>	Gram Panchayat Development Plan
<b>MKSP</b>	Mahila Kisan Sashaktikaran Pariyojana
<b>NAFCC</b>	National Adaptation Fund for Climate Change
<b>NDCs</b>	Nationally Determined Contributions
<b>SLD</b>	Shared Learning Dialogues
<b>SAPCC</b>	State Action Plan on Climate Change
<b>SHG</b>	Self Help Group
<b>SIRD</b>	State Institute of Rural Development
<b>SLD</b>	Shared Learning Dialogue
<b>SRLM</b>	State Rural Livelihood Mission
<b>VDMP</b>	Village Disaster Management Plan



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# Glossary

There is more than one definition for many of the terms listed below. It is important to understand how the terms are used in this manual in order to present the material and to help participants clarify terms as needed.

<i>Training course</i>	The sum of all training modules for a target group. A training course can have a duration of one day or several.
<i>Training module</i>	The sum of all tools / sessions associated with a phase of local adaptation planning
<i>Training session</i>	Smallest training unit that can serve both knowledge and information transfer (e.g. video material, infographics, case studies) as well as a participatory, interactive approach (joint completion of a risk matrix). All sessions clustered under one phase will build a training module.
<i>Modular approach</i>	Thanks to the modular approach, a training course can be structured according to the specific needs of the target group with the help of the CDP toolkit. To this end, different sessions can be combined with each other in different ways, taken out or also expanded with additional details and facts. This ensures that the specific training needs/learning objectives and different knowledge levels of the participants can be addressed. The knowledge base of the participants can be very diverse, ranging from participants with little to no understanding of climate change to those who are already familiar with the main CCA requirements.
<i>Phases of local adaptation planning</i>	The training courses are based on a logical sequence of 6 phases for local climate adaptation planning (see section 0.2 of this trainer's manual). The term phase represents the steps of an adaptation project starting with the assessment of climate change impacts and related risks to project design and operation and monitoring of a facility.
<i>Co-creation</i>	Co-creation describes the process of early involvement of customers, end-users and experts from different disciplines in the early discovery phase of product development. In this way, co-creation broadens the perspective on problems and solutions to include different backgrounds of experience and specialist perspectives, thus increasing ownership and at the same time reducing the risk of blind spots and wrong paths due to misconceptions.



# 0 INTRODUCTION TO THE TRAINING



## 0.1 Background

### Relevance of the topic and need for capacity development

Climate change is affecting land, water, forestry, and other dependent livelihoods. While the Covid-19 pandemic dominated our lives in 2020, climate change continued to intensify, making 2020 one of the warmest years on record. Despite encouraging trends towards climate adaptation at the global level, the 2020 Adaptation Gap Report (UNEP 2020)—which is a flagship report published by the UN since 2014 looking at where the world stands in planning, financing and implementing adaptation actions—describes the extent of adaptation progress at the national level as insufficient. However, the longer we wait to take effective adaptation action, the more expensive and consequential the impacts of climate change will become at multiple scales, with the potential to far exceed the costs of adaptation.

The Global Climate Risk Index 2020 (Germanwatch 2021) ranks India as the fifth most vulnerable country to climate change. The key contributing factors for this were the prolonged monsoon phase in 2019, which affected 11.8 million people with the economic damage estimated to be US \$ 10 billion, and the eight tropical cyclones in 2019 that formed one of the most active cyclone seasons in the northern Indian Ocean since records. The state of Himachal Pradesh is particularly vulnerable to the impacts of climate change due to its hilly terrain and fragile ecological systems. Common natural disasters include earthquakes, landslides, flash floods, cloudbursts, avalanches, forest fires, affecting land, water, forestry, and other dependent livelihoods of the local population in HP (Envistats India report 2020).

Capacities for climate change adaptation are currently being built in a wide range of sectors in India. With the establishment of the National Adaptation Fund for Climate Change (NAFCC) in 2015 and the initiated revision of the State Action Plans on Climate Change (SAPCCs) in 2019, the Indian government has created important incentives for the implementation of ambitious adaptation measures and projects. However, there is still scope for adaptation projects to better address the needs of the local population. While most current projects comply with generally valid standards, the actual needs on the ground and especially those of women (e.g. high workload of women in the agricultural sector, limited access to agricultural inputs, advisory services or for decision-making) are sometimes neglected unknowingly and dominant power relations are reproduced. In this way, Climate Change Adaptation (CCA) projects often do not reduce climate risks efficiently for the most vulnerable groups as they are not involved in planning and lack access to finance for their adaptation projects.

### Purpose and scope of the capacity development package

#### About the project:

In order to reduce the risks of climate change for vulnerable groups, the Indian Ministry of Environment, Forests & Climate Change (MoEFCC) has initiated the Climate Adaptation and Finance in Rural India (CAFRI) programme together with GIZ. The Department of Environment Science and Technology (DEST), Govt of Himachal Pradesh (HP), is the nodal agency in HP for the programme and coordinating all capacity building efforts. As part of this programme, adelphi, GEAG and CTRAN supported the development of a Capacity Development Package (CDP)—of which the trainer's manual is part of mainstreaming climate change adaptation into local planning processes in HP.

For PRI-members, as one of the main target groups of the CDP, knowledge products and tools are provided to raise awareness and change behaviour towards climate resilience. Further, women farmers will be trained and empowered to successfully plan, implement and operate evidence-based adaptation projects by making use of existing governmental support schemes.

In this regard, the CDP follows the following overarching principles:

- supporting local adaptation needs,
- considering convergence with ongoing schemes,
- strengthening the role of intermediary organisations,
- supporting gender responsive participatory planning,
- fostering behavioural change towards CCA/ climate resilience,
- providing inputs for indicating CCA element in policy,
- enhancing ownership and advises on financing mechanisms for the local adaptation needs.

Multiple workshops with key training institutes and relevant departments as well as interviews with target group representatives to assess the local needs and site visits laid the groundwork for the CDP.

## 0.2 Training programme and methodology followed for planning, implementing and operating adaptation projects

The methodology used by the capacity building package follows the logical sequences of local adaptation planning. Figure 1 below shows the arrangement of the CDP's modules and their key steps and assessment methods.

To develop, implement and operate adaptation projects, the CDP considers seven main steps (see Figure 1):

### Module 1. Understanding climate change and its impacts

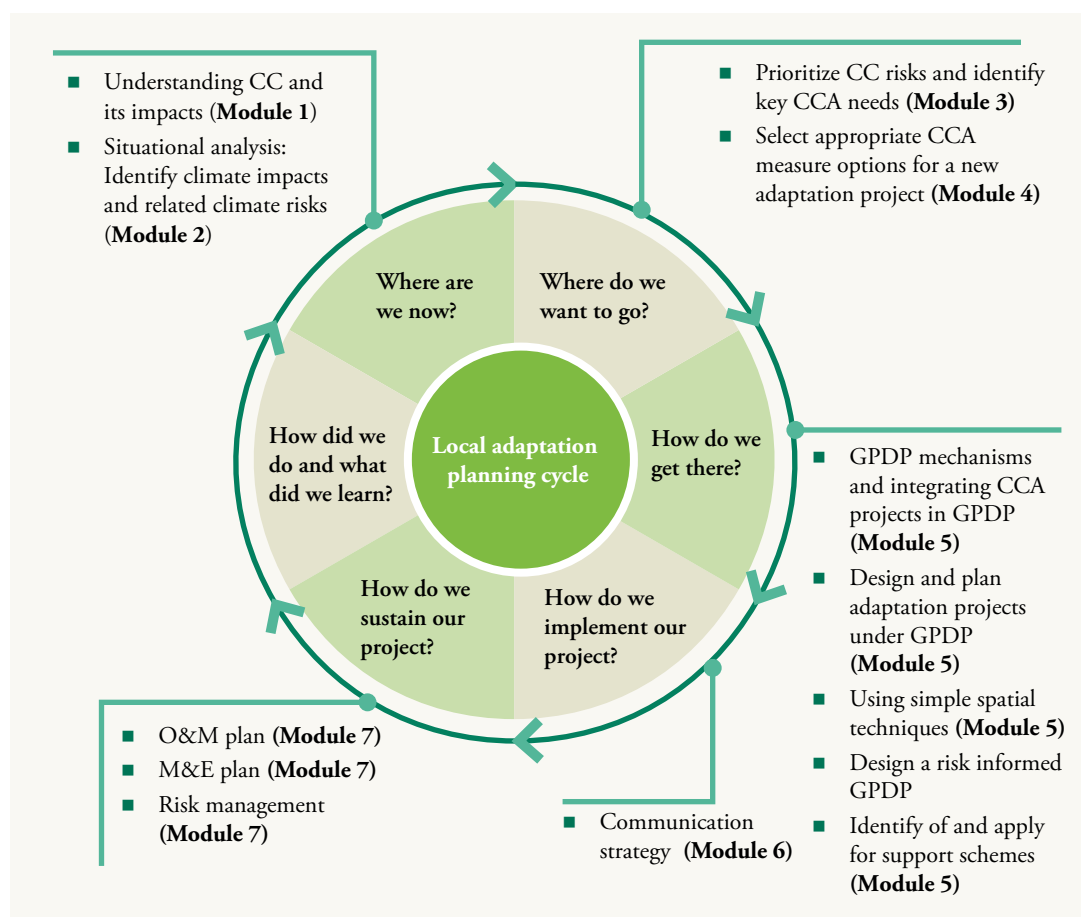
First and foremost, before starting to plan an adaptation project, participants will be provided with a **basic understanding of climate change, its causes and impacts** on their sectors and livelihoods.

### Module 2. Climate change impacts and related risks

Having taken an overarching perspective on climate change phenomena, Module 2 looks at the **impacts of climate change on the lives and livelihoods in the rural areas of HP**. The participants will be sensitised to the **significant risks to agriculture, water, forest and other infrastructures and impact on livelihood and income of the vulnerable groups in HP**. The module concludes with the **identification and assessment of relevant climate impacts and related risks to the participants**.



**Figure 1.** Arrangement of the CDP's modules along a local adaptation planning cycle



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## Module 3. Adaptation needs

Once climate risks have been identified, participants **identify their related adaptation needs** to address prioritised risks. These needs provide a first rough idea for an adaptation approach. Participants are informed about the results of a recent needs assessment of the target group in HP and receive an overview of relevant adaptation approaches on farm, ecosystem and extension level.

## Module 4. Adaptation measures

Participants will learn about **best adaptation practices** at sectoral level (agriculture, water, forestry, etc.) as well as for farming system resilience, ecosystem services, resilient extension, before they **identify, assess and select the most appropriate adaptation measures** for their own most pressing needs.

## Module 5. Designing adaptation projects

In this module, participants learn how to design their adaptation project considering **GPDP planning processes**. After a general introduction to GPDP processes and their **linkages to DRR and climate change risks**, as well as to the integration of risk-informed plans to address CCA-DRR issues within GPDP, participants design their own interventions to link **risk and resilience**, making optimal use of synergies between different measures. The **project design** involves: (1) defining specific **objectives and project outputs**, (2) developing a **village-level action plan** with timeline, resources and roles, (3) **generating databases** for local-level adaptation planning and integrating

them into sectoral plans and the GPDP. Skilled experts will gain insight into **spatial technology for NRM-based planning**. After developing a project design, participants will **link their adaptation actions to relevant support schemes** and institutions and learn how to **apply for them**. In this module, special emphasis has been on **GPDP and DRR linkages and the flagship MGNREGA programs**.

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## Module 6. Implementing adaptation projects

Module 6 provides participants with key concepts for implementing adaptation projects. Developing an internal and external **communication strategy** enables participants to gather ideas and create ownership in their communities for their adaptation efforts, demonstrate their adaptation efforts to government agencies, and neighbouring communities, and network with others on the topic of CCA.

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## Module 7. Operating and sustaining adaptation project

Participants will learn key concepts for increasing the sustainability of their adaptation projects. This includes the development of an **operation and maintenance plan**, a **monitoring and evaluation plan**, and **risk management**.

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# 0.3 Materials provided with the CDP and their preparation

This training manual is part of a larger capacity development package for CCA planning that additionally includes presentation slides, participant's handouts and a course planner:

**Trainer's manual:** The trainer's manual helps the trainer plan and conduct the training. The introductory chapter provides helpful information on the motivation for the trainings and the identified local needs, how the training help drive local adaptation planning processes, how to adapt the training content to the specific target audience including suggestions for designing different training lengths, and what documents are included in the overall CDP. In addition, guidance on the accessibility and use of local past and future climate data is provided. Chapter 1 includes didactic principles for the trainer, including how to open the training, help participants focus, consolidate input learned and collect feedback, and evaluate the training. The heart of the Trainer's Manual is Chapter 2, which guides the trainer through the implementation of each training module designed for the target audience. It provides a step-by-step introduction for each training session, including an overview of the different steps, the methodology used, the objectives, the purpose, and details on how to use the tools. In addition, detailed instructions are provided on how to present the tool/ examples using cards, sticky notes, or flip chart paper. The trainer's manual should be studied by the trainer prior to conducting the training.

**Presentation slides for each session:** including a first slide for each tool with a step-by-step introduction and an overview of the different steps taken as well as objectives, purpose and one application example. In addition, for each session a concluding slide provides the participants with key take-away and follow-up questions if appropriate.

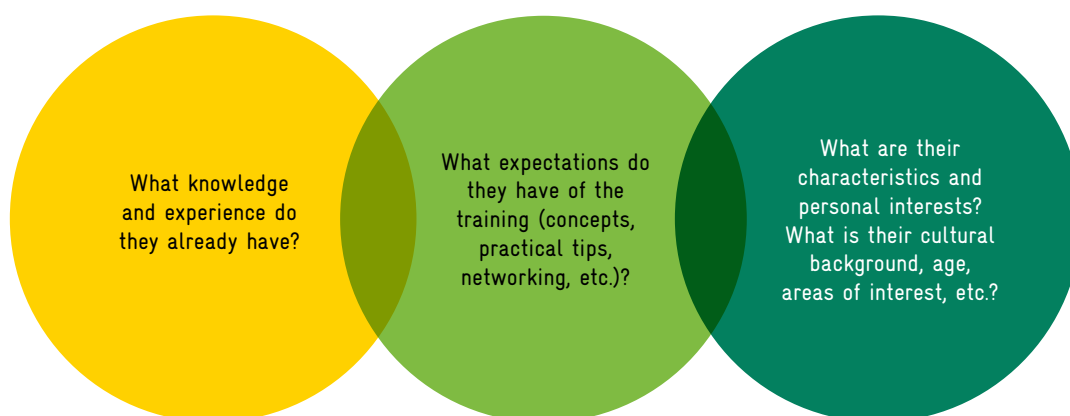
**Handouts for each session:** For each session, participants receive handouts with background reading, illustrative examples and worksheets. The worksheets summarise the tasks of the exercises and provide a framework for group work. The handouts are designed to help participants follow the training sessions and collect their results from the exercises. This way they can easily remember their results and assumptions and reuse them at a later stage both during the training and after the training. The handouts are prepared in a way that they can be used by the participants to replicate the exercise for new contexts.

**Course planner:** A course planner supports the trainer in planning the whole training by providing an overview of the available sessions with their objectives, duration, suggested methods, materials needed and suggestions for session constellations for different training durations.

**Excel tool:** The ExcelTool helps the trainer to collect key results during capacity development. This clear compilation of the results will make it easier for the participants to prepare, apply for, implement and monitor CCA projects in a structured way after the course. Following the structure of the CDP's modules, the tabs of the ExcelTool provide the possibility to collect results of the following key topics: Climate change impacts and risks (tab 1), CCA needs (tab 2), CCA measures (tab 3), project design (tab 4), scheme matching (tab 5), Gender Action Plan (GAP, tab 6), communication (tab 7), operation and maintenance (tab 8), M&E and risk management (tab 9).

## 0.4 Adapting the training materials and programme to the target group

A key success factor of any training workshop is that the training content and methods are tailored to the specific needs, interests and expectations of the participants. Before conducting a training, get to know your participants' expectations, needs and constraints. By involving them and relating to their experiences, you will be able to keep their interest and attention and enable them to transfer training content to real life situations. Important questions when adapting the training content to the specific group could be:



To support the trainer in adapting the training programme to specific participant groups, the CDP provides a **modular design**: The CDP offers several stand-alone, optional sessions that the trainer can combine according to the needs, knowledge level and time allotment of the participants. This approach allows the inclusion of participants with little understanding of climate change to those who are already familiar with the main CCA requirements. Depending on the target group, in-depth engagement with different topics starting at different levels is possible. In addition, given the range of CCA measures, new details and facts can be easily added to each training course allowing adaptation to current CC scenarios and the needs of the specific participant group.

The following list includes important hints for preparing and adapting the materials (further hints can be found in the sessions' descriptions):

- **Adjust the wording** to prior knowledge, interests and skills of your target group.
- **Adjust the workshop method** depending on the literacy of the group (identify before you start your training).
- **Choose appropriate methods**: the CDP materials proposed specific methods (discussions, transect walk, seasonal calendar, etc.) you are free to adapt these methods if you consider a

different approach more suiting for the specific participant group. A selection of different methods with short instructions on how to apply them can be found in chapter 1.

- **Choose additional interactive methods** (examples found in chapter 1) for better learning results and to make your training more interactive and less tiring, especially if the session is composed mainly by input.
- **Choose relevant, local climate data, examples and case studies** (for guidance on how and where to access current and future climate data, see chapter 0.4.1)
- **Integrate your participants expertise and experience.** Mostly it's easier to follow the workshop and learn, when there is a base in the local knowledge and experience, and the participants can talk also about their daily life.
- For trainings that take place on several days, **integrate feedback and evaluation**, in order to keep track on the understanding, learning progress and the mood of the participants. Depending on the results, always stay flexible for better adapting the training to the needs of the target group.

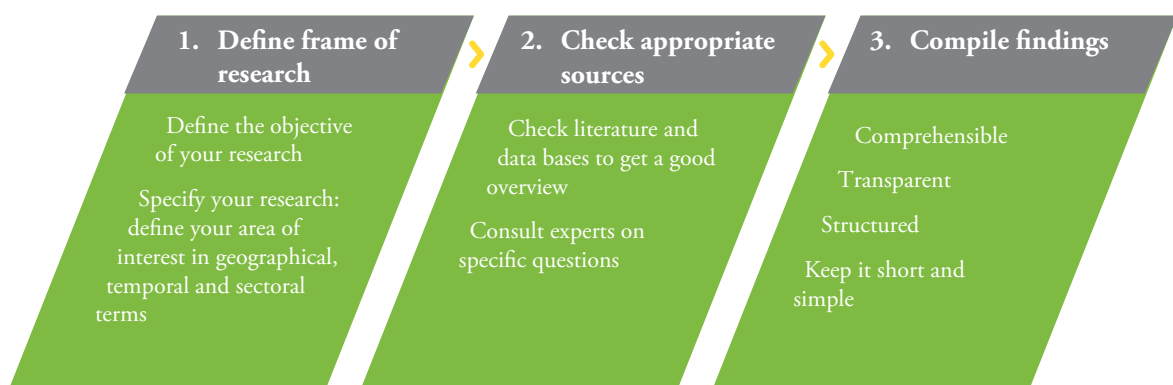
### 0.4.1 Using relevant, local current and future scientific data on climate variations and vulnerability

The sessions include climate data as well as examples and case studies of practical application to better understand and illustrate the theories and exercises of the sessions, which may be adapted to the context of the specific group. In particular, specific provided climate data may be up-to-date at the time of the CDP's creation (2021), but may no longer be relevant in 2-3 years. It is therefore recommended to do a short research on current climate scenarios and risks before conducting a training.

#### 1. For what do I need scientific climate data?

- **Identifying key challenges** (e.g. which regions/sectors are vulnerable to climate change)
- **Selecting strategies** (e.g. how to reduce vulnerability in a region/sector/ how to achieve development objectives despite climate change?)
- **Designing technical responses** (e.g. define storage capacity of a new reservoir/select irrigation technology)

#### 2. Guiding principles for data research and management



Source: adapted from GIZ 2009: Climate information for effective adaptation

#### 3. Where to access scientific climate data?

**On international level:** Studying climate data on a global level helps to compare your specific situation with other regions and put it in the big picture. Knowing where people are facing similar challenges can help in finding best practices.



*Exemplary websites:*

- **Climate Change Knowledge Portal (CCKP) by World Bank Group:** online platform for access to comprehensive global, regional, and country data related to climate change and development. The CCKP consists of spatially and temporally referenced historical and future data. Users are able to evaluate climate-related vulnerabilities, risks, and actions for a particular location on the globe by interpreting climate and climate-related data at different levels of details. Enter the platform here: <https://climateknowledgeportal.worldbank.org/>
- **Global and Regional Adaptation Support Platform (ci:grasp) by Potsdam Institute for Climate Impact Research (PIK):** climate information service providing sound knowledge on current and projected climate stimuli, climate impacts and adaptation options at the national, sub-national and regional level  
Enter the platform here: <http://www.pik-potsdam.de/cigrasp-2/index.html>
- **On local level:** it is important to study how the climate change scenario is presented for India in general and specifically for the regions of your training participants. The platforms below provide data on past and future trends of climate hazards and risks, but also proven tools for adaptation. You may use this information as case studies in your trainings to guide and inspire participants in developing their adaptation strategies.

*Exemplary websites:*

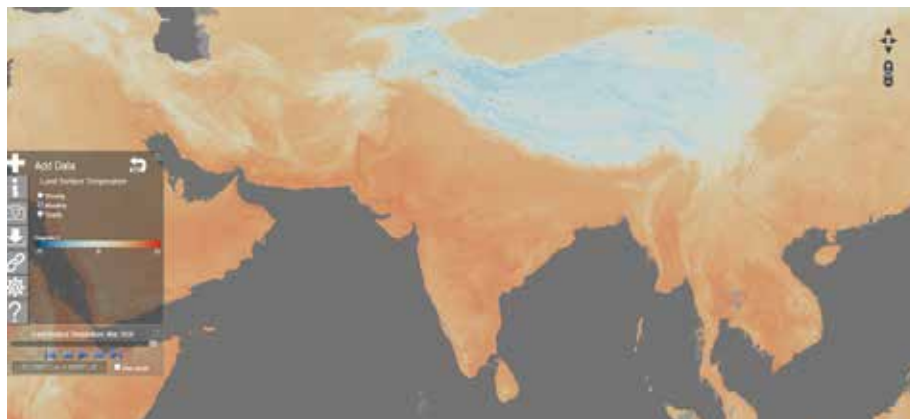
- **State action plan on climate change published by Department of Environment, Science and Technology, Government of Himachal Pradesh (2012):** for Himachal Pradesh:  
<http://moef.gov.in/wp-content/uploads/2017/08/Himachal-Pradesh.pdf>
- **Climate Change Knowledge Portal (CCKP) by World Bank Group:** Explore the CCKP historical and projected climate data, impacts, key vulnerabilities and what adaptation measures are being taken for India:  
<https://climateknowledgeportal.worldbank.org/country/india>

#### 4. How to present and visualize climate data to the training group?

Maps and other illustrative material help participants to easier access scientific data. There are a number of online platforms and software packages available to access or generate image maps or graphs of historical climate data or future climate projections. Some free examples are presented below.

- **NOAA View Data Exploration Tool by National Oceanic and Atmospheric Administration (NOAA):** Image map viewer with more than 60 global datasets. You can also display specific dates, animate time series, and download .png images or KMZ (Google Earth) files. Enter the platform here: <https://www.nvdl.noaa.gov/view/globaldata.html>

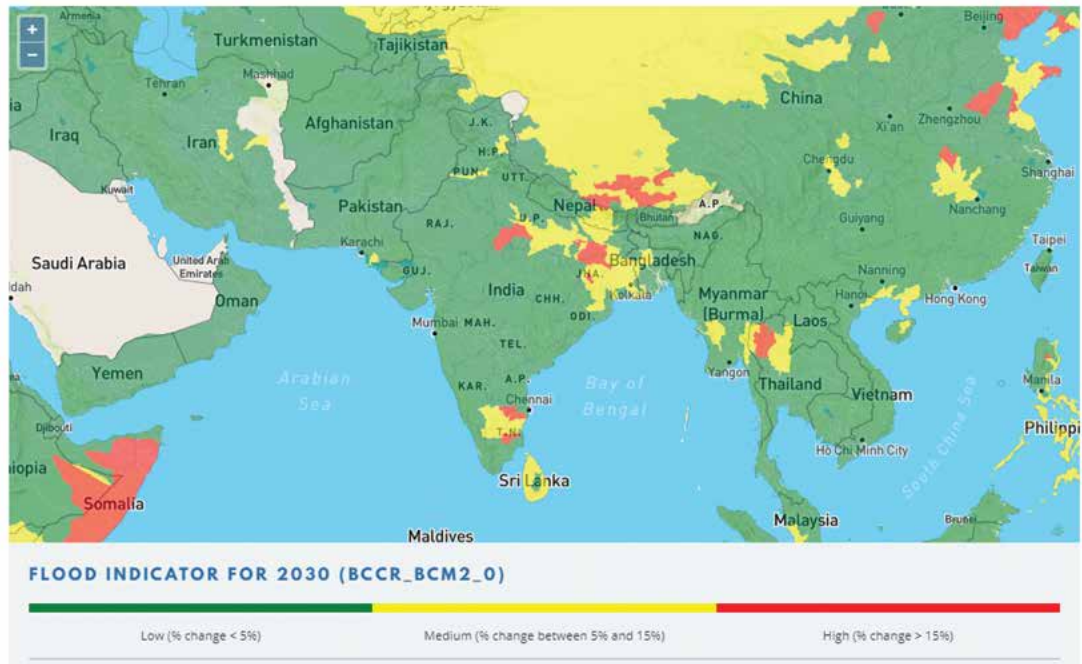
**Figure 2.** Monthly land surface temperature by NOAA View Data Exploration Tool



- **Climate Change Knowledge Portal (CCKP) by World Bank Group:** Various maps and graphs presenting past and projected climate data. Enter platform here: <https://climateknowledgeportal.worldbank.org/country/india>

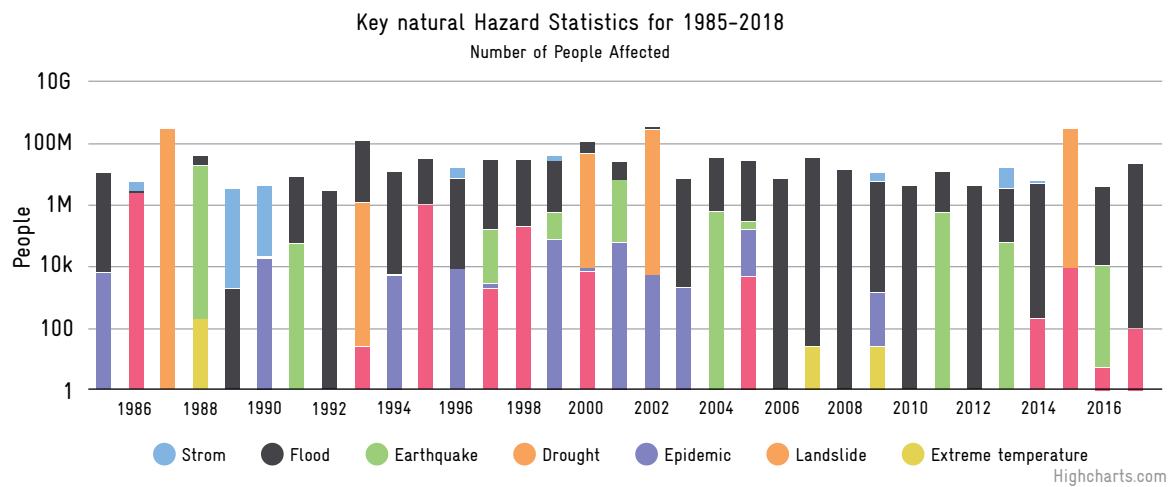
*Examples are presented below:*

**Figure 3.** Flood indicator for India (and the world) for 2030



<https://climateknowledgeportal.worldbank.org/country/india/impacts-water>

**Figure 4.** Bar chart presenting key natural hazard statistics for India for 1985–2018



Source: World Bank Group <https://climateknowledgeportal.worldbank.org>

## 0.5 Training course options

The following four calendars show options for training courses of varying duration and focus.

For successfully carrying out the training courses, a participant size of about no more than 20 participants is recommended.

### Half-day Training

Half-Day
Introduction, purpose of training (10 min)
<b>Session 1.1</b> Climate change and its causes (45 min)
<b>Session 1.2</b> Vulnerable regions, target groups and impacts of climate change in HP (60 min)
<b>Session 2.1</b> Experience sharing on impact of climate change on development interventions related to agriculture, water resources and DRR at village level (60 min)
Wrap-up and feedback (10 min)
<i>Lunch break</i>

### 3-Day Training

Day 1	Day 2	Day 3
Introduction, purpose of training, expectations (15 min)	<b>Session 3.3 Step 2-3</b> Defining climate change adaptation needs (60 min)	<b>Session 5.5</b> Adaptation measures that can be leveraged through GPDP/MGNREGA vis-à-vis schemes and programmes (30 min)
<b>Session 1.1</b> Climate change and its causes (45 min)	<b>Session 4.1 Step 2</b> Input sessions on best practices for climate adaptation (30 min)	<b>Session 5.6</b> Identifying further relevant support schemes for adaptation projects (60 min)
<b>Session 1.2</b> Vulnerable regions, target groups and impacts of climate change in HP (60 min)	<b>Session 4.2 Step 1-2</b> Identifying, assessing and prioritizing adaptation measures to selected CCA needs (90 min)	<b>Session 5.7</b> How to apply for the relevant schemes for CCA-DRR (60 min)
<b>Session 2.1</b> Experience sharing on impact of climate change interventions related to agriculture, water resources and DRR in the local context (60 min)		
<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>
<b>Session 2.2</b> Assessing the impacts of climate change and identify related risks to the lives and livelihoods of rural communities (2h)	<b>Session 4.2 Step 3</b> Identifying, assessing and prioritizing adaptation measures to selected CCA needs (30 min)	<b>Session 6.1 Step 1-2</b> Developing a communication strategy (1 h 30 min)
<b>Session 3.2</b> Prioritising identified climate risks (45 min)	<b>Session 5.1</b> Gram Panchayat Development Plan (GPDP) mechanism and integration of natural resource management (NRM) issues to address climate and disaster risk (90 min)	<b>Session 7.1 Step 1</b> Understanding the concept of operation and maintenance (30 min)
<b>Session 3.3 Step 1</b> Identifying CCA needs of village communities related to human development and social security (60 min)	<b>Session 5.2</b> How to have a risk informed adaptation plan for integration into GPDP (60 min)	<b>Session 7.2 Step 1</b> Understanding the concept of Monitoring and Evaluation (30 min)
Summary of day	Summary of day	<b>Session 7.3 Step 1</b> Risk identification (30 min)
		Wrap-up and feedback (15 min)

## 5-Day Training

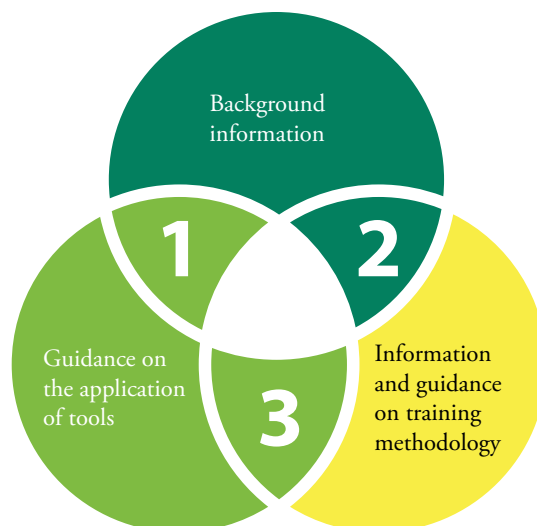
Day 1	Day 2	Day 3	Day 4	Day 5
<p>Introduction, purpose of training, expectations (15 min)</p> <p><b>Session 1.1</b> Climate change and its causes (45 min)</p> <p><b>Session 1.2</b> Vulnerable regions, target groups and impacts of climate change in HP (60 min)</p> <p><b>Session 2.1</b> Experience sharing on impact of climate change interventions related to agriculture, water resources and DRR in the local context (60 min)</p>	<p><b>Session 3.2</b> Prioritising identified climate risks (45 min)</p> <p><b>Session 3.3</b> Defining climate change adaptation needs (2h)</p>	<p><b>Field trip</b> (half day)</p>	<p><b>Session 5.3 Step 2-3</b> Designing a project for selected adaptation measures that can be integrated into GPDP planning processes (3 h)</p>	<p><b>Session 5.7</b> How to apply for the relevant schemes for CCA-DRR (60 min)</p> <p><b>Session 7.2</b> Monitoring and evaluation plan (1 h 30 min)</p>
<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>
<p><b>Session 2.2</b> Assessing the impacts of climate change and identify related risks to the lives and livelihoods of rural communities (2h)</p> <p><b>Session 3.1</b> Recently conducted needs assessment (20 min)</p> <p>Summary of day</p>	<p><b>Session 4.1</b> Input sessions on best practices for climate adaptation (40 min)</p> <p><b>Session 4.2</b> Identifying, assessing and prioritizing adaptation measures to selected CCA needs (2h)</p> <p>Summary of day</p>	<p>Session 5.1 Gram Panchayat Development Plan (GPDP) mechanism and integration of natural resource management (NRM) issues to address climate and disaster risk (90 min)</p> <p>Session 5.2 How to have a risk informed adaptation plan for integration into GPDP (60 min)</p> <p>Session 5.3 Step 1 Review and outlook: local adaptation planning cycle (30 min)</p>	<p><b>Session 5.4</b> Use of simple spatial techniques for NRM planning (60 min)</p> <p><b>Session 5.5</b> Adaptation measures that can be leveraged through GPDP/ MGNREGA vis-à-vis schemes and programmes Summary of day (30 min)</p> <p><b>Session 5.6</b> Identifying further relevant support schemes for adaptation projects (60 min)</p> <p>Summary of day</p>	<p><i>Selection of 2 sessions from Module 6 and 7</i></p> <p><b>Session 6.1</b> Developing a communication strategy (2 h)</p> <p>AND/OR</p> <p><b>Session 7.1</b> Operation and maintenance (O&amp;M) plan for environmental infrastructure measures (1 h 30 min)</p> <p>AND/OR</p> <p><b>Session 7.3</b> Risk Management (1 h 30 min)</p> <p>Wrap-up and feedback (15 min)</p>



## 0.6 Trainer's manual – approach and structure

The trainer's manual combines three components to enable trainers to effectively build capacities of women farmers to plan and implement CCA measures:

- **Background information** on important terms and concepts related to climate change impacts in India and mainstreaming adaptation in local planning.
- **Guidance on the application of exercises** to plan and implement adaptation projects
- **Information and guidance on training methodology**



The methodological advice to the trainer includes:

- At the outset of each module a **module overview** sums up learning objective, training duration and a “**module planner**” providing an overview of all sessions included
- Introduction to each session with information about the **learning objective**, necessary **prerequisites/ prior knowledge for successful participation**, overview of the different **steps**, **session duration**, **methods** employed, **materials** needed as well as their **preparation**.
- Relevant **background information** prepared for **input presentations** to help participants carry out suggested exercises, group discussions or present the knowledge material, definitions of key terms, etc.
- **Detailed guidance** on how to carry out **participatory exercises** with visualization instructions and useful hints for the trainer and **group discussions** and on how to use the worksheets that are provided to the participants with the handouts.
- Each session concludes with recommendations on **useful literature and databases** that stimulate further research, **key take-away** for participants and **debriefing questions** to collect feedback from the participants and to improve the training.

## 0.7 Who can use the trainer's manual?

**The State Institute for Rural Development (SIRD)** is a leading training institution in the state of HP. It conducts approximately 120 programmes per year. Out of which 70 programmes are of 5 days duration each and 50 programs are of 3 days duration each. They train around 1800 trainees per year covering officials like Block development officers, PRI members, etc. They also use their extension training centres to train PRI members at district levels. Out of the needs identified they currently provide training on Block Panchayat Development Plan preparation. The water issues are now merged in this planning process. Now a days training is provided to JE, Zilla Parishad members, Panchayat Pradhans, Technical Assistants on “SECURE” software for estimation and calculation of cost of proposed infrastructure. SIRD also has a cell to run programmes on disaster preparedness.

**Himachal Institute of Public Administration (HIPA)** is the state's apex training institute (ATI) for capacity development and has a dual role as ATI and SIRD. Its mandate is to build the capacity of all rural development stakeholders and Panchayati Raj Department functionaries and elected representatives of PRIs besides line department officials. It has been operating in the state since 1982. HIPA is therefore best suited and has confirmed its interest to provide training and CDP developed under CAFRI to PRI members and embed this in the existing training infrastructure.

**The Panchayati Raj Institute of Training (PRIT)** is recognized as an Extension Training Centre under the Ministry of Rural Development and trains officials of PRRD (Panchayat Raj and Rural Development Departments) as well as PRI members in related CC topics such as disaster risk management, etc.

**Women and Child development department** can benefit from mainstreaming CC issues in women and child health and gender related aspects covered in the module.

**Sectoral departments** also can use the specific modules to train the state resource persons and staff.

Another key actor for implementing the developed training programme is the **State Agricultural Management & Extension Training Institute (SAMETI)**, which is a training institute for frontline workers of agriculture and horticulture department and the farmers including specific module for mahila krishaks (women farmers). The agency runs training programs on use of technology in agriculture as well as climate resilient agriculture and contingency planning under SREP, extension management and entrepreneurship.

**Irrigation and Public Health:** The department does not have its own training facility but a significant sectoral contribution as a specialist department in agriculture and water security is expected from them.

**The Department of Environment & Scientific Technologies (DEST)** is the focal institution for all climate change related issues. The agency is responsible for creating awareness on climate change impacts and aids departments in climate action planning, mobilizing additional finances for climate change adaptation.

The **Forest training and research institute (FTRI)** is primarily responsible for training the forest guards and rangers on issue relating forest protection and management. It also runs refresher courses for officials and has reasonable training infrastructure.

**Block, District and the State government officials of identified departments,** namely, agriculture, horticulture, animal husbandry, water resources, rural development, and disaster management, especially dealing with the relevant identified schemes. An overview of these schemes able to integrate and use the CDP is provided in Table 4.

**Table 1.** Support schemes offered by departments that are suited to integrate and use the CDP

Department suitable to use and multiply CDP	Existing programme in which the CDP could be integrated	Target group or departments trained	Thematic focus/ identified needs addressed
Agriculture, Horticulture and Animal Husbandry Department, Water Resources	Mission on Agricultural Extension & Technology (NMAET) – Sub-Mission on Agricultural Extension (SAME)	Women Farmers, MKSP women self-help groups	Resilient farming, Extension Services, Resilient inputs, Water management, Agro-forestry, Drinking water and rejuvenation of spring sheds
	National Mission on Oilseeds and Oil Palm (NMOOP), Kusum Scheme		
	National Mission for Sustainable Agriculture (NMSA)		
	Backyard Poultry Development Program under National Livestock Mission		
	National Horticulture Mission (NHM)		
	Integrated Pest and Nutrient Management		
	RKVY		



Department suitable to use and multiply CDP	Existing programme in which the CDP could be integrated	Target group or departments trained	Thematic focus/ identified needs addressed
<b>Panchayat Raj Department</b>	Relevant sectors under Finance Commission Grants Pradhan Mantri Krishi Sinchayee Yojana	PRI members	Integrating resilient agriculture, water management and DRR aspects in GPDP
<b>Rural Development (MNREGA)</b>	MGNREGS SRLM/NRLM	MKSP women groups and PRI members	Planning and utilization of MNREGA resources for improving ecosystem services and risk informed GPDP

## 0.8 References

UNEP DTU Partnership, World Adaptation Science Programme (WASP) 2020: Adaptation Gap Report 2020. Retrieved 21 June 2021 from: <https://www.unep.org/resources/adaptation-gap-report-2020>

Germanwatch 2020: Global Climate Risk Index 2020. Retrieved 21 June 2021 from: <https://germanwatch.org/de/19777>

# 1 TRAINING DIDACTICS: GUIDING PRINCIPLES FOR TRAINERS



When designing a training, it is important to plan a good mix of input and interactive exercises and energisers. This not only helps at the beginning of a training to get to know the participants better, but also creates the necessary variety and movement during the training that helps:

- boost concentration,
- consolidate the input learnt and
- contributes to better networking among the participants

This chapter presents:

- 1.1 Energizers** – gets participants moving, having fun and ensures that the energy level of the group is high.
- 1.2 Participatory training methods** – put the theoretical input into practice, or further developing the input by doing it yourself.
- 1.3 Visualisation** – facilitates the communication of a message through images, diagrams or animations. The connection to the senses increases the learning potential.
- 1.4 Feedback and evaluation** – supports you as a trainer to get feedback from the participants: What key take-away messages could the participants take from the session? Were the participants' expectations and learning objectives met? How can you improve your training?

#### Learning level

It is already well known that adults have a bigger capacity to learn and absorb what is transmitted if it is not just heard, but also seen, discussed and practiced. Have the right table in mind, when you realise your session.

**Table 2.** Learning level

Learning competence of adults, when they...	
Only read	10%
Only hear	20%
Only see	30%
See and hear	40%
Discuss	50%
Experience (see, hear and implement)	70%
Teach	90%

*Source: United nations 2001*

#### Inform learners of the learning objectives

Setting clear goals is the key to successful training. It is necessary that participants keep on track throughout the training session. Remind them regularly of the learning objective (described at the beginning of each session).

# 1.1 Energizers

## Why to use energizers?

### Icebreakers and workshop introduction

- Break the ice and give participants the opportunity to get to know each other
- Create a pleasant working atmosphere
- Uncover the participants' level of knowledge and their expectations

### During the training

- Wakes up the group when they seem tired and unfocused
- Helps with concentration
- Lets people connect and thereby qualifies the group work

## Introduce your neighbour – Opening a workshop

**Material needed:** cards or flipchart with questions and additional cards for the participants to write something down

### Steps:

- Ask the group to pair up with one of your immediate neighbours.
- Each person has 3 minutes to introduce themselves before talking about: name, age, background, where are you from, reason for participating in the training.
- Then each pair has 1 minute to introduce each other to the group.

### Hints:

- Write down the questions on flipchart or cards pinned to a wall. This helps the participants to remember what to talk about.
- Depending on what you want to find out, adapt the questions.
- You can have participants write key information on cards, pin them on the wall and leave them there during the training/workshop.

### Benefits

- Participants get into direct contact
- Active listening necessary because they have to reproduce the knowledge
- This is a good exercise when you work with the topic of communication

### Limitations

- Time consuming
- Participants might get distracted during the presentation round.
- Unsuitable for a group size of more than 10

## Throw a ball – Opening a workshop

**Material needed:** 1 Ball, cards or flipchart with questions

### Steps:

- Form a standing circle
- Explain that the person receiving the ball will introduce themselves and tell the group: Name, what they expect from the training and what they know about CCA interventions.



- 
- Then throw the ball to the next person until everyone has been introduced.

**Hints:**

- 
- Write the questions on a flipchart or cards pinned to a wall. This helps the participants to remember what to talk about.
- 
- Depending on what you want to know and how much time you have, adjust the questions
- 
- If there are people who cannot stand, you can also do the method sitting down
- 

**Benefits**

- Participants get in touch with the whole group
- Physical movement and quick interaction
- Suitable for indoors and outdoors
- It is fast.

**Limitations**

- Not very profound
- People could have difficulties catching the ball.



## Bingo

**Material needed:** Prepared Bingo-cards for each participant.

Has five or more children	Knows to sing the national anthem	Enjoys snowfalls in the hills and meadows
Likes Cherries	Has already worked in an CCA project	Believes in horoscope
Knows to stand on two hands	Has a vegetable garden at home	Had to walk for more than an hour to get here
Has a rainwater harvesting system	.....	.....

### Steps:

- Distribute the prepared bingo sheets to each participant.
- Ask the participants to talk to other participants to see if he/she can answer “yes” to items in the boxes on the sheet.
- If “yes”, the other participant has to write his/her name in the corresponding box.
- Have all the participants do the same thing at the same time. The participant who gets signatures in all the boxes first has to announce the names who have to prove their “competences” and is declared the winner.

### Hints:

- Design a sheet with local information
- It is better to include aspects where people need to ask and talk to each other

#### Benefits

- Vast not just technical information of the participants is provided
- Very interactive
- Good to cheer up the mood

#### Limitations

- Time consuming
- No useful for levelling expectations

## Blind mathematic

**Material needed:** a long rope forming circles, scarf to unfold the eyes

### Steps:

- The group forms a circle and blindfolds with the scarf.
- Give each person the rope in their hand.
- Now ask them to form a square.
- Then reflect with the group: what was easy, what was difficult, what helped, what made the situation more difficult?

#### Hints

- If the group is large, form two or three groups.
- For more difficulty, have the participants do the exercise without speaking.
- Use the exercise to assess roles within the group. In general, it is easier if the group listens to each other, or if there is a leader who gives instructions and the others follow. It is also possible to reflect on gender roles and dominance.
- Try to compare the course of the exercises with CCA projects.

#### Benefits

- Helps the groups trust.
- Active listening will be trained.
- Training of group cooperation and observation.
- Cheers up the mood and helps with concentration.
- Trains the tactile skills of the group (listen, feel, smell).



## 1.2 Participatory training methods

Participatory training methods are an educational strategy in which learners are active participants in the training, and their needs and questions, their reflection and analysis, and their strategies for change carry the process forward.

### Role play

**Objective:** A role play is a structured activity, usually in the form of a dramatic performance, that re-enacts a real-life situation. Role play can be used to analyse a problem and identify its causes and solutions. It is also useful for making comparisons between ideal and real-life conditions.

**Material needed:** The “script” or scenario should be prepared with a clear focus on the selected topic or theme.

#### Steps:

##### Before the role-play:

- Select the topic or theme and identify the key points to be depicted.
- Prepare the play scenario and develop the roles to be played in light of the key points.

##### During the role-play:

- Explain the role play and the play scenario and its purpose.
- Distribute the different roles among the group. There can also be observers.
- Ask performers to prepare for the performance.

##### After the role-play

- Ask performers and observers to express what they learned from the performance (ask questions based on the theme of the performance and encourage discussion)
- Summarize the findings of the discussion.

#### Hints:

- You can note central information on cards or flipcharts around the room.
- Ask the participants to dive into their role, maybe even using some accessories.
- Help the performers to act out their parts if needed.
- There are different forms of role play: silent role play, statue theatre, theatre of the oppressed etc. – do some further research, if you like role plays.

#### Benefits

- Increase self-perception and enhance the ability to identify real-life problems.
- Enhances learning because the participants dive in the topic and transform knowledge in practise

#### Limitations

- Time consuming (for both preparation and realization)
- Self-conscious or quiet participants may not want to take part in the role play.
- The impact of the role play upon the participants depends on the capacity of the performers.
- To reduce preparation time and avoid observer boredom, a role play exercise should not be too long.

## Scales

**Objective:** Identify the opinion or knowledge of the group.

**Material needed:** A line on the floor, cards marking positive and negative position

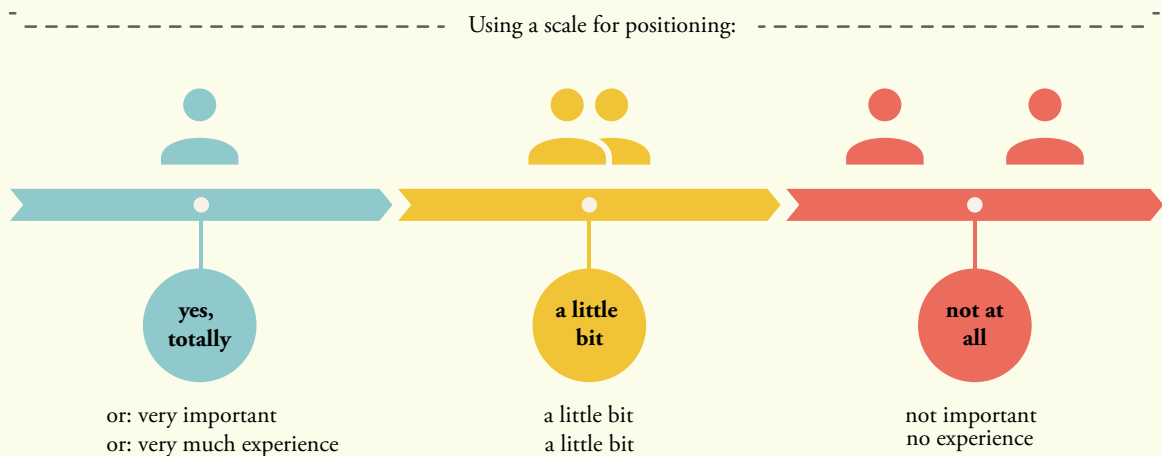
### Steps:

- Draw or stick a line on the floor and mark one side with the agreeing phrase, the other line with the disagreeing phrase.
- Then the trainer asks a question and the group should position themselves to record each person's opinion/knowledge.
- Then the trainer asks some of the participants why they are positioning themselves where they are.

### Examples:

- *"What topic under the training programme interests you the most? (you may offer different spots in the room as the 5 thematic modules)"*
- *"What role does climate change adaptation measures play in your life?" (Can be a scale from "no role" to a "very important role")*
- *"Do you have previous experience with project development? (a scale from "no experience" to "very much experience")*

### Using a scale for positioning:



### Hints:

- If the trainer observes that there are strong (opposite) opinions, can be engaged in a more profound discussion

#### Benefits

- Get an overview if the opinion/knowledge of the whole group.
- The method is interactive.
- Discussion possible: can motivate the group to involve in profound discussion.
- Not time consuming

#### Limitations

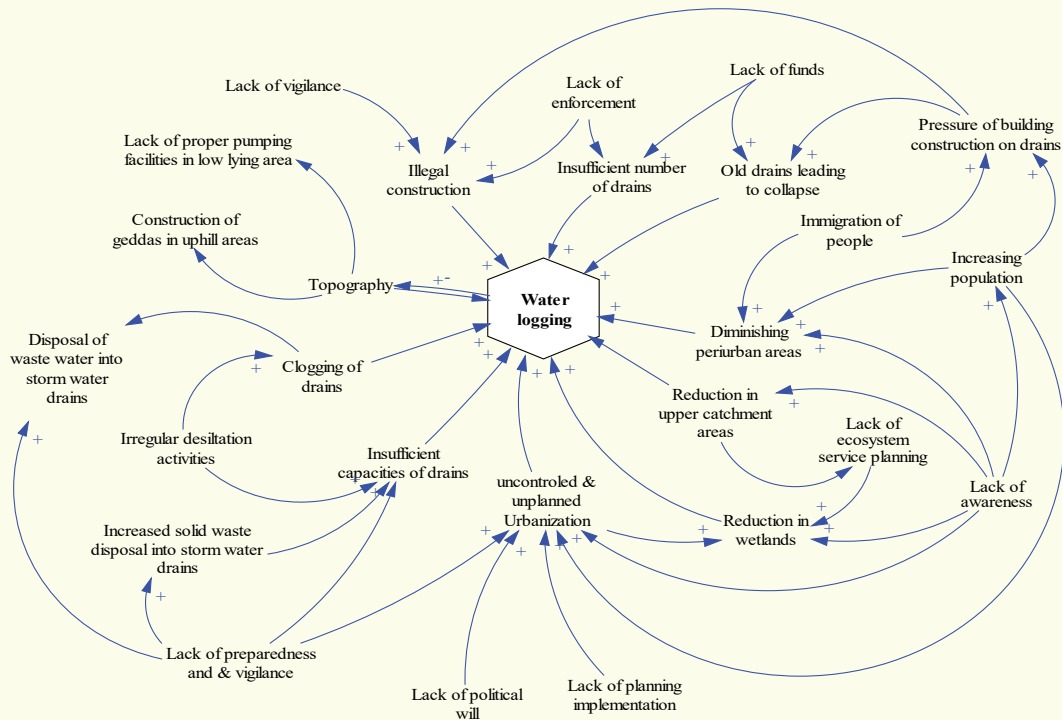
- People sometimes follow the opinion of the group, because they don't want to be exposed.

## Causal Loop Diagram

### Objective:

- To visualize how different variables in a system are interrelated.
- Participants themselves identify the various reasons of a problem, which are directly or indirectly linked to the problem and its intensity.

**Materials needed:** Flipchart, pen



### Steps:

- Define a topic/problem for which a causal loop diagram shall be developed. E.g. let the participants identify the most significant changes observed during last 10-15 years (e.g. migration, change in cropping pattern, change in water situation) and write it in the center of the flipchart.
- Ask the participants to identify primary reasons/causes of the defined problem. Write them on cards and pin them on the flipchart, then draw an arrow with a "+" in the direction of the problem as done in the Figure above.
- Do the same for identified secondary causes (of primary causes, e.g. income- reduced outputs in farming, livelihood- not much work in village etc.) and tertiary causes etc. creating a system of nodes and relations.
- If participants identify something which has a positive impact on the problem (reduction of climate impact causing water scarcity), draw an arrow indicated with "-".
- Open discussion. In the context of climate change, e.g. discuss linkages of the identified causal loops to climate change. Put a different color card on all causes that are linked to climate change. Also, discuss who (vulnerable groups) is most affected by the problem and its causes.



---

### Hints:

---

- This exercise can be used more openly as mind-mapping of a specific topic.
  - The diagram consists of a set of nodes and edges. Nodes represent the variables and edges are the links that represent a connection or a relation between the two variables
- 

#### Benefits

- Participants themselves identify the various direct and indirect causes of a defined problem.

#### Limitations

- Very complex exercise.
- Timely.

### Transect walk

**Objective:** A transect walk is a walk through a geographical area with one or more participants and the documentation of what you see and hear. There are three standard types: Village, Resource and Cultural transect walks. Resource transects seek to document the resources available to a particular society that could be used for development purposes. Village transects deal with infrastructure and describe the living space of the community of interest. Cultural transects are most focused on human activities.

**Material necessary:** paper, camera

### Steps:

- Define the route and goal
  - Realize the defined route/ transect walk with the participants noting everything that is observed during the walk referring to the defined objective
  - Review and analyse material with the participants
- 

### Hints

- If time is short, the transect walk can also be recorded beforehand.
- 

#### Benefits

- Very participatory
- Literacy is not necessary
- Easy applicable in a village context

#### Limitations

- Timely
- Need to be at the place of interest.

## Seasonal analyse (e.g. seasonal calendar)

**Objective:** Find out community perceptions on time- and season-related variations on indicators such as climate impacts, production patterns (crops), food security, etc.

### Material needed:

- Drawing on the ground: soft ground, stones, sticks and other available material to produce symbols.
- Drawing on a paper: big sheet of paper, pencils, markers.

### Steps:

- Preparation of the matrix: Let the participants draw a matrix with horizontal linear time-scale (e.g. month of a year) and indicators (e.g. crop patterns, rainfall patterns) along the vertical axis
- Identify the starting event with the participants.
- Prepare questions in advance to guide the participants completing the calendar.
- Discuss the result with the group.

#### Hints

- Forming groups of different genders or ages to fill out their own calendars can gain insights into how different groups function within a community (or household).
- Several themes can be combined within a calendar, e.g. plant growth and rainfall patterns. Use one column for each theme.
- It is possible to designate symbols for the month and for the events instead of writing (e.g. when the calendar is drawn on the ground).

#### Benefits

- Very participatory
- Can provide important information on gender or age-based views.
- Very relevant to analyses CC impacts.
- Easy applicable in a village context

## 1.3 Visualization

### What:

- Use images & diagram to facilitate communication & learning
  - Express ideas emerging from dialogue and reflect and share ideas
- 

### When:

- During training session to record what has been done- useful in subsequent days
  - Assists the people who may first be hesitant to speak
- 

### Why:

- Enhances the learning process and ensures that information stays in the minds of participants for a longer time
  - Facilitates communication and learning
- 

### How:

#### *For trainers:*

- Trainers draw images and diagrams
- Use a combinations of presentation tools for 1 session. Example: Diagram on a **pin board** and present the details in a **PowerPoint presentation**, and write down the main points in a **flip chart**.
- Picture, charts, and drawings are more expressive and memorable

#### *For participants:*

- Present the results in bold, big print letters that can be legible from 6-8 meters
  - Each card can only have 1 idea
  - Color code to differentiate between different aspects of the exercise
  - Follow instructions in the hand-out
- 

### Hints:

- People cannot simultaneously read and listen, thus limit wordy PowerPoints. Instead use: flip charts, pin boards & moderation cards.
-

## 1.4 Feedback and evaluation

Feedback and evaluation in training is a method to get feedback from participants on whether they liked the training (e.g. in terms of methodology, content, setting, etc.) and to determine the level of learning. Feedback guides the trainer to stay “on track” and to regularly improve the training to better achieve its goal or purpose. Effective feedback is usually descriptive rather than evaluative. Feedback can come through a formal critique/method or be perceived through informal responses.

### Hints:

- Ask participants for daily feedback or at the end of each session (see debriefing questions) for better adapting the training to the participants needs. Guiding questions: “*What did you like today?*”, “*What could be improved in tomorrow’s training?*”
- Trainers should avoid responding to the feedback or defending themselves. However, they are allowed to ask for clarification.

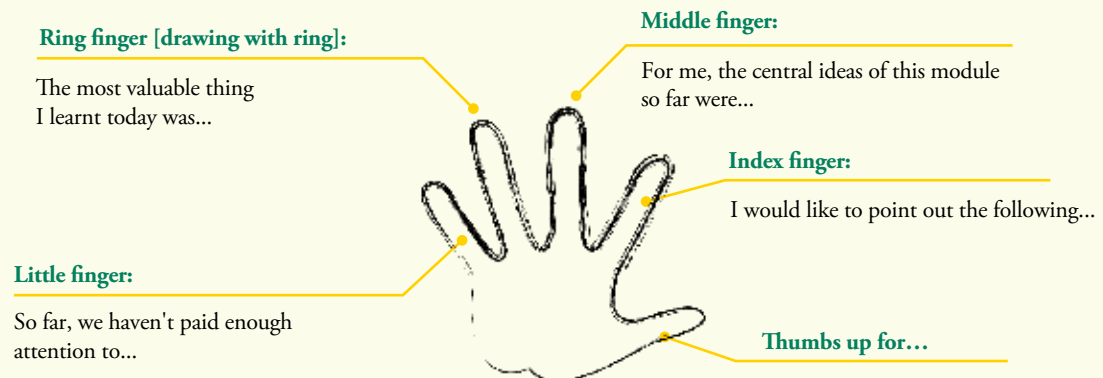
### Five-fingers-feedback

#### Objectives:

- To receive feedback about the different aspects of your training and the perception of the state of mind of the participants

#### Steps:

- Two possibilities to realise this type of evaluation:
  - Individual: you give a paper to every participant and ask to draw their hand on the paper.
  - Group: Draw a big hand on a white board or the flip chart
- On each of the fingers, write the questions below. Then discuss the day’s training and write key points on the board or flip chart.



#### Benefits

- The individual evaluation is a good method to leave no one behind
- Group method: fast and the focus is on central points, because generally the people don't repeat a lot.
- To receive complex feedback.

#### Limitations

- Individual method: timely
- Group method: you lose the individuals opinion. Some person could be too shy to answer.
- Reading and writing necessary

## Evaluation gallery

An effective and complex way of receiving feedback is the evaluation gallery.

### Steps:

- Draw the following pictures and write the questions on a flip chart, pinning the sheets to the walls of the training room to make a sort of gallery:
  - Drawing of a light bulb: What was new to me? What important information and ideas did I get out of the training?
  - Drawing of a computer: What things that I learnt can I apply in my work?
  - Drawing of a rubbish bin: What would I like to leave behind? What was not relevant for me?
  - Name of each trainer: How did I like the trainers in this module? What did they do well? What could they have done better?
  - Did the group work well together? What was the atmosphere like?
  - What else would I like to add?
- Put pens next to each sheet and ask the participants to write their views anonymously. When everybody has finished writing, the gallery is open for viewing.
- At the end, the trainer read out some of the comments, asking for clarification where appropriate and summarizing the results.

### Hints:

- Take photographs of the gallery for documentation purposes.

#### Benefits

- Focus on your evaluation topic.
- Good for documentation purpose.

#### Limitations

- Reading or writing necessary.
- Timely.

# 2 TRAINING COURSE FOR PRI-MEMBERS



## Module 1. Understanding climate change and its impacts

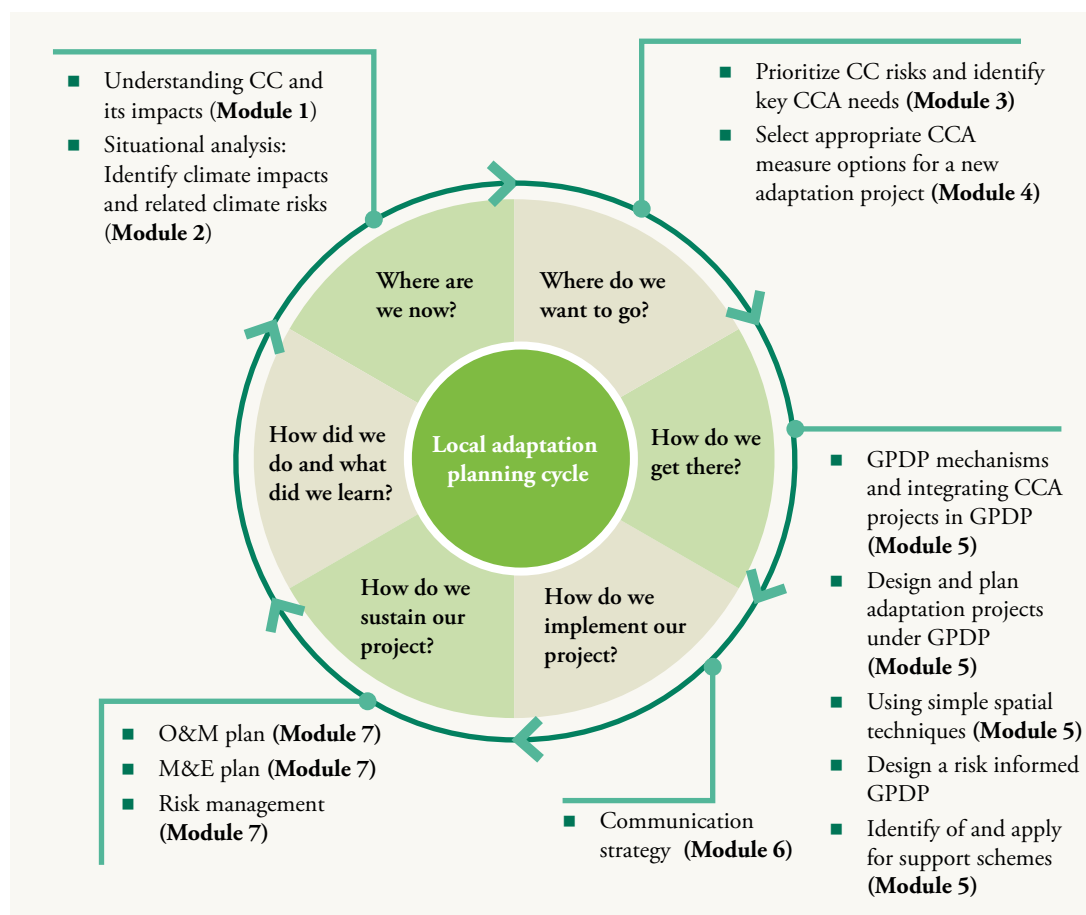
<b>Learning objective</b>	To understand climate change, scenarios and impacts in different agro-climatic regions of HP
<b>Duration</b>	Shortest version: 45 min Complete version: 1 h 45 min At the field level (including site visits): 2 h 30 min

### Module planner

Duration	Sessions of module	Shortest version	Complete version
45 min	Session 1.1 Climate change and its causes	×	×
60 min	Session 1.2 Vulnerable regions, target groups and impacts of climate change in HP		×

### Integration of Module 1 along the local adaptation planning cycle

The methodology used by the capacity building package follows the logical sequences of local adaptation planning. The right figure shows the arrangement of the CDP's modules, their key steps and methods employed. The colour yellow indicates that you are in Modul 1 and Step 1 of the local adaptation planning cycle, which provides participants with an understanding of climate change and it's impacts. In the ExcelTool you will find a tab in the same yellow. Here you can document the results achieved by your group of participants in module 1.



## Session 1.1 Climate change and its causes

Learning objective	To understand on climate change and its causes in general	
Prerequisites / prior knowledge for successful participation	Brief understanding of climate and climate change	
Steps (duration)	<b>Step 1.</b> Why you should know about climate change	5 min
	<b>Step 2.</b> Weather and climate change	5 min
	<b>Step 3.</b> Evidences of climate change	5 min
	<b>Step 4.</b> Causes of climate change	10 min
	<b>Step 5.</b> Climate change scenarios in the past and projections for India and HP	20 min
Total duration	45 min	
Methods/Exercises	Input presentation, discussing past and future climate variations	
Material	PowerPoint presentation 1.1, handout 1.1, Laptop, LCD projector	
Preparation of the material	You may update past global climate change scenarios and projections for UP, if they are no longer up to date (status 2021).	

### Step-by-step approach

This session focuses on understanding climate change and its causes in general. Participants will learn to distinguish between weather and climate (**Step 1**) and understand what climate variability and extreme weather events are (**Step 2**), how they affect the planet and their causes, looking at natural and anthropogenic factors (**Step 3**). Finally, they analyse how past and projected global climate change scenarios affect the Earth and its livelihoods, with a regional focus on HP (**Step 4**). At the end of the session, participants discuss their learnings from the session, referring to experiences in their local contexts.

### Step 1. Why you should know about climate change

#### Input presentation

- Present slide 3 (presentation 1.1 - Climate change and its causes) to the participants

According to IPCC's fourth assessment report, the word 'Climate change' refers to significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer. In the last few decades, anthropogenic causes have accelerated the rate of change in the climate significantly. Consequently, the pattern of precipitation and temperature has changed, increases the incidence of water and vector-borne diseases, deteriorated the air quality, and enhanced extreme events. Thus, in nutshell, it has not remained a global phenomenon rather it has become an everyman concern to understand how the climate is changing, what are the causes behind it and how it will make an impact on the life of people. By understanding the concept of climate change, it will help people to better prepare for the future.



## Step 2. Weather and climate change

### Input presentation

- Present slides 3 (presentation 1.1- Climate change and its causes) to the participants.

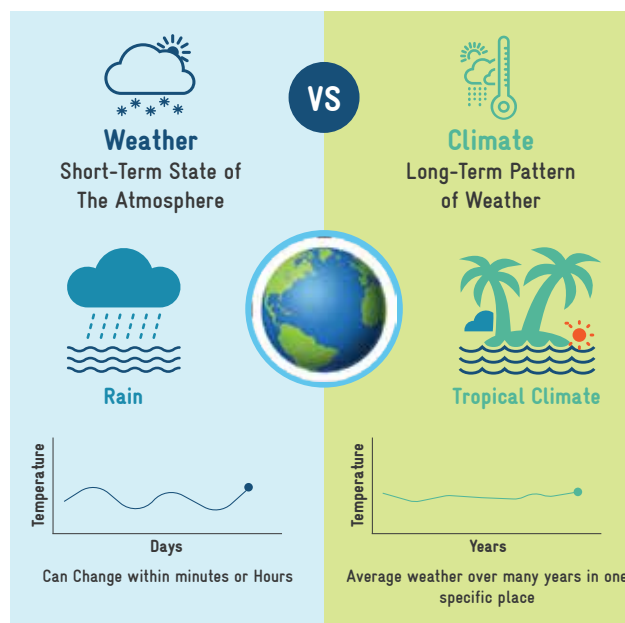
### Difference between climate and weather

We hear about weather and climate all of the time. Most of us check the local weather forecast through our newspaper, TV, Radio etc. to plan our days. Some time in our usual talk we use weather and climate in the same way and confuse over the difference between the two.

**Weather** is an hour-to-hour, day to day condition of the atmosphere. Weather can change dramatically from day to day.

**Climate** represents the average weather condition of a place for a longer period of time. Scientifically, a minimum of 25 to 30 years of weather data have to be considered for reliable statistical determination of the characteristic of a climate. Climate is never static; it is subject to fluctuation. Thus, the term '**climate change**' is defined as the climatic variations in historic time over the span of a few thousand years.

**Figure 5.** The difference between weather and climate



Source: <https://www.dreamstime.com/weather-versus-climate-vector-illustration-educational-differences-diagram-nature-measurement-scheme-temperature-days-image162882783>

## Step 3. Evidences of climate change

### Input presentation

- Present slide 5 (presentation 1.1 - Climate change and its causes) to the participants

### Recent climate change vs natural climate variations

The planet earth has witnessed many variations in climate since the beginning. Geological records show alteration of glacial and inter-glacial periods. The geomorphological features, especially in high altitudes and high latitudes, exhibit traces of advances and retreats of glaciers. The sediment deposits in glacial lakes also reveal the occurrence of warm and cold periods. The rings in the trees provide clues about wet and dry periods. Historical records describe the vagaries in climate. All these evidences indicate that change in climate is a natural and continuous process. Historical records of crop yield or crop failures, of floods and migration of people tell about the effects of changing climate.

However, despite natural periodic climatic changes over millions of years, since the mid-20th century humans have been exerting an unprecedented influence on the Earth's climate system, causing changes on a global scale.

IPCC 2007: "Climate change is a global phenomenon. Climate change refers to changes in the climate that are directly or indirectly attributed to human activities. This causes changes in the composition of the earth's atmosphere, which are over and above the natural variability in climate."

There is widespread consensus in the scientific community that recent climate change is caused to a large extent by greenhouse gas emissions caused by human activities. Natural factors play only a secondary, minor role (e.g. volcanic eruptions, changes in solar irradiation, or changes in the earth's rotational path). To mitigate the ongoing climate change human beings all over the world will have to drastically reduce greenhouse gas emissions.

### Gradual climate change vs. extreme weather events

In addition to the gradual changes in trends (of temperatures, precipitation, humidity, sea level, etc.) over longer periods of time, the increase in extreme weather events is another face of climate change. There is a widespread understanding that these extreme weather events are influenced by higher average temperatures and are thus indirectly linked to human greenhouse gas emissions. Extreme weather events include floods and droughts, cyclones, hurricanes and tornados, heat waves, thunderstorms, hailstorms and dust storms, fog or cold waves.

## Step 4. Causes of climate change

### Input presentation

- Present slide 6 (presentation 1.1 - Climate change and its causes) to the participants

Figure 6. Climate change causes



Source: GEAG, 2021

**Natural factors:** can be grouped into astronomical and terrestrial causes. The astronomical causes are the changes in solar output associated with sunspot activities. Alike moon, Sun has also sunspots. Sunspots are dark and cooler patches on the sun which increase and decrease in a cyclical manner. According to meteorologists, when the number of sunspots increase, cooler and wetter weather and greater storminess occur. A decrease in sunspot numbers is associated with warm and drier conditions. Yet, these findings are not statistically significant. In terrestrial cause volcanism is considered as another cause for climate change. Volcanic eruption throws up lots of aerosols into the atmosphere. These aerosols remain in the atmosphere for a considerable period of time reducing the sun's radiation reaching the Earth's surface. After the volcanic eruptions, the average temperature of the earth fell to some extent for some years.

**Anthropogenic factors:** primary cause of climate change since the mid-20th century. The most important anthropogenic effect on the climate is the increasing trend in the concentration of greenhouse gases effect in the atmosphere which is likely to cause global warming. Due to the basic physics of heat-trapping gases and an exponential rise in population and energy consumption, humans have become a force of nature. The scientific results have shown that:

- Human activities, particularly the combustion of fossil fuels, are altering the climate system.
- Human-driven changes in land use and land cover such as deforestation, urbanization, and shifts in vegetation patterns also alter the climate, resulting in changes to the reflectivity of the Earth surface, emissions from burning forests, urban heat island effects and changes in the natural water cycle.
- Because the primary cause of recent global climate change is human, the solutions are also within the human domain.
- Because we understand the causes of climate change, that paves the way for effective solutions to be developed and deployed.

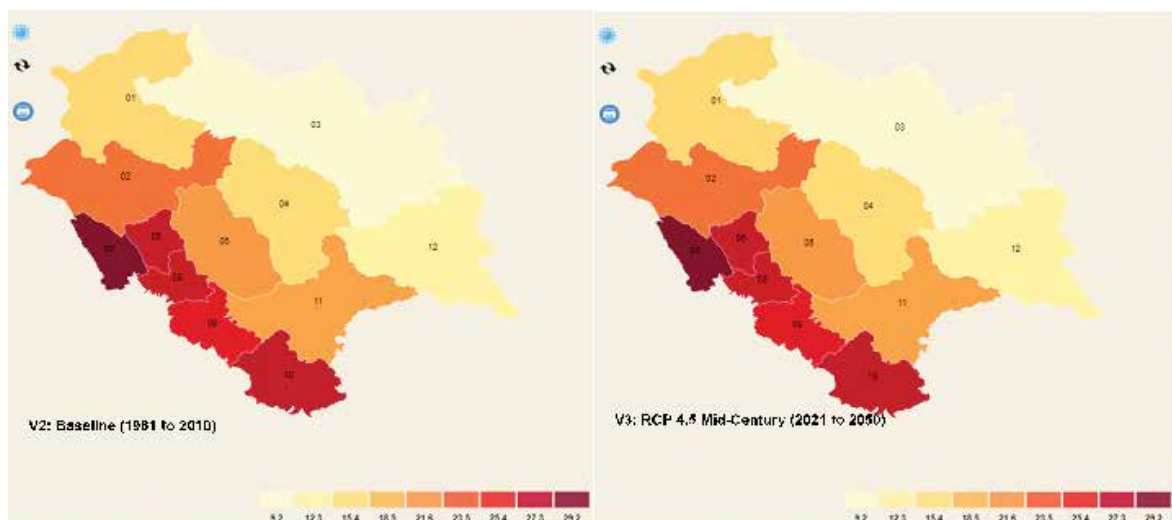
## Step 5. Climate change scenarios in the past and projections for India and HP

### Input presentation

- Present slide 6-12 (presentation 1.1 - Climate change and its causes) to the participants
- If time allows, you can show the video on “Global climate change scenarios in the past and projections for India”. Please find the video online available here: <https://www.youtube.com/watch?v=O5bWYMAAduU&t=95s>
- After showing the video to the participants, put the 4 maps below showing past and future climate change trends in UP on a wall. Explain the changes.

### Temperature trend

Figure 7. Past and predicted temperature trend for HP



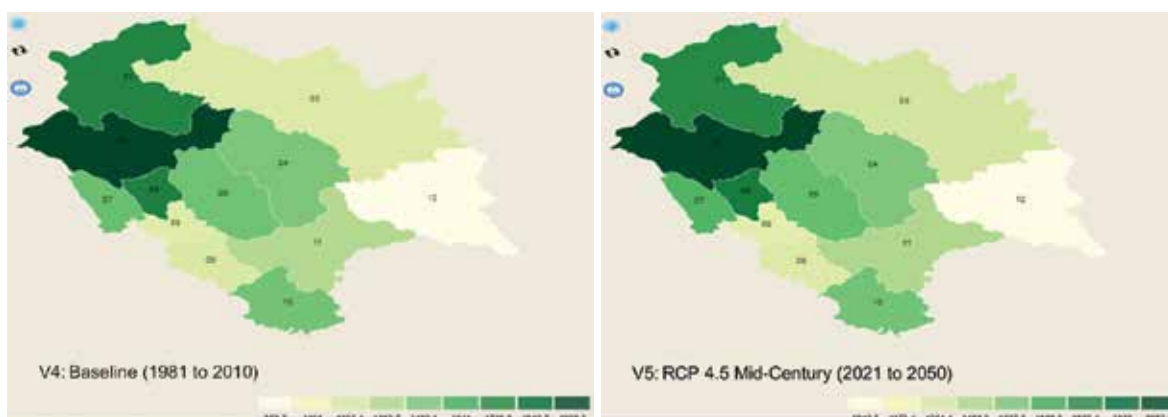
Source: Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP

**In the past:** It has been observed that the mean annual maximum temperature of the state is around 19.6 degree Celsius; the analysis shows both increase in maximum and minimum temperature

**Projected future trend:** Mean annual maximum temperature for RCP 4.5 scenario shows 21.0 degree Celsius; that is projected to increase by about 1.4 degrees Celsius by mid-century

## Precipitation trend

Figure 8. Past and predicted precipitation trend for HP



Source: Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP

**In the past:** It has been observed that the average annual rainfall of the state is around 1449.5 mm; the analysis of annual rainfall reveals a negative trend indicating that the total amount of rainfall received has been decreasing

**In future:** Mean annual rainfall for RCP 4.5 scenario shows 1534.9mm, that is projected to increase marginally by about 5.9% towards mid-century

## Group discussion

- Encourage the participants to discuss gradual climate change and extreme weather events they observed in their regions in the past. What are the common causes participants perceive that result in climate change?

Guiding questions:

1. Do the different regions of the Uttar Pradesh have experienced extreme rainfall and temperature events in different seasons in recent past?
2. Does the pattern of rainfall has changed locally?
3. How much maximum and minimum temperature goes up and down during different seasons? Have you noticed any change in it?
4. What further climate change variations did you observe in your region over the last 10 years and what impact have these climate changes had on your livelihood, resources and life?

## Useful literature

- National Ocean Service: What is the difference between weather and climate? Available at: [https://oceanservice.noaa.gov/facts/weather\\_climate.html](https://oceanservice.noaa.gov/facts/weather_climate.html)
- Lester Barber: What is the Difference Between Weather and Climate? ppt available at: <https://slideplayer.com/slide/10161379/>
- National Council of Educational Research and Training (2020-21): Fundamentals of physical geography. Chapter 12: World climate and climate change. Book available at: <https://ncert.nic.in/textbook.php?kegy2=12-16>
- Rural Agricultural Development Authority (RADA) of Jamaica: Adapting to climate change: a training manual for farmer. Available at: <https://rada.gov.jm/sites/default/files/documents/Adapting-to-Climate-Change-Farmer-Instruction-Manual.pdf>

## Key take-aways

At the end of this session, participants will be able to understand:

- Difference between climate and weather
- Various causes of climate change

## Debriefing questions

- What are your important take-aways/ messages from this session?
- Which of the presented facts do you find most relevant for your situation?
- Did the session help you understand the key scenarios and their causes for climate change? Are there any questions left unanswered?
- What is the difference between weather and climate change?

## Session 1.2 Vulnerable regions, target groups and impacts of climate change in HP

Learning objective	To understand the target groups possessing vulnerability towards climate change
Prerequisites / prior knowledge for successful participation	Knowledge on impact of climate change on Panchayat Raj institutions (PRIs)
Total duration	60 min
Methods/Exercises	Input presentation, discussing climate impacts on the lives and livelihoods and the vulnerability of the participants
Material	PowerPoint presentation 1.2, handout 1.2, Laptop, LCD Projector
Preparation of the material	You may update the given facts and figures on climate change and vulnerability, should they no longer be up-to-date (status 2021)

## Approach

The DEST undertook a rigorous analysis of climate and disaster related data along with socio-economic and developmental indicators to identify the most vulnerable agro-climatic regions in HP, impacted by climate change. Further, the assessment also looked at identifying key sectors and the target groups who are most vulnerable to the impacts of climate change. This section explains the regions, sectors and target groups that are vulnerable to climate change impacts in HP.

## Input presentation

- Present slides 3-5 (presentation 1.2 – Vulnerable regions, target groups and impacts of climate change in HP) to the participants

### General introduction: Identification of vulnerable regions, target groups and impact of climate change on village development (slide 3)

Climate Change causing an increase in temperature leading to increase in aridity index and decrease in rainfall, leads to significant level of socio-economic disruption and environmental degradation of the rural areas. On the basis of recorded timeline of extreme events due to climate change, researchers claim for futuristic shortage in availability of water, energy and food in the state of Himachal Pradesh. The Panchayat Raj Institution (PRI) are not only left over with the brunt of managing humanly impacts of extreme events like heat waves, cold waves, flood, drought etc. in form of disaster response but the PRIs are also responsible for executing the efforts for management of long-term impact of hazards like vector & water borne diseases in extreme events, food shortage in drought, livelihood losses caused to farmers in case of flood or drought, pest attack, fire etc.

The PRIs are the key for enhancing the climate resiliency of village by integrating the measures of mitigation and adaptation and aligning the concerns of climate change resiliency into the development activities. The Gram Panchayat Development Plan (GPDP) is the basic unit of developmental planning which is a platform for convergence of various schemes and programmes. Appropriate planning and capacity building on GPDP are crucial for PRI members. The utilization of large-scale resources of the National Rural Employment Guarantee Act (MGNREGA) on the basis of GPDP priorities by PRI members can upscale village development by enhancing disaster and climate resiliency of the village.

#### Impacts of climate change on rural development in Himachal Pradesh (slide 4)

Increasing vulnerabilities due to climate change are multi-dimensional and interlinked. It is varying across location, sectors, communities, households, and individuals (gender). Over the past decades, Himalayan Region in general and Himachal Pradesh has witnessed recurrent hydro-meteorological hazards like Glacial Outbursts and Floods (GLOF), droughts, heat waves, cold waves, extreme rainfall that have not only impacted the people but also have dragged behind the development of the state.

Owing to the dependency of villages on utilization of natural resources for their livelihoods, they are more at risk because climate change is consistently causing a decline in the availability of natural resources. Some of the commonly encountered impacts of climate change experienced in villages of HP are: decline in the availability of drinking water and irrigation water as fresh water streams and groundwater are adversely impacted in drought; discontinuation of education and damage to school infrastructure; damage to communication network and power supply; livelihood risk due to shortage of natural resources; health risk due to changes in water borne & vector borne diseases; damage to asset, housing and infrastructure. The above mentioned are the impacts of climate



change, which are experience by urban as well as rural areas but rural areas being underdeveloped areas are more heavily impacted due to extreme events. These increasing impacts of climate change in villages can be countered by PRIs by adopting a few of the steps like- sensitization of the Village Disaster Management Committee (VDMC) on how climate change impacts their livelihood in the form of flood, drought, rainfall etc.; availability of water, food and energy as VDMC is the milestone player for enhancing the disaster resiliency of villages; ensuring the maintenance of water supply and drainage system in the village before the flood season; developing spatial and temporal database for water quality surveillance and evaluation; bolstering national health schemes and programmes in the village through GPDP for curbing the spread of diseases in extreme events etc.

#### Target groups of vulnerable regions possessing vulnerability towards climate change (slide 5)

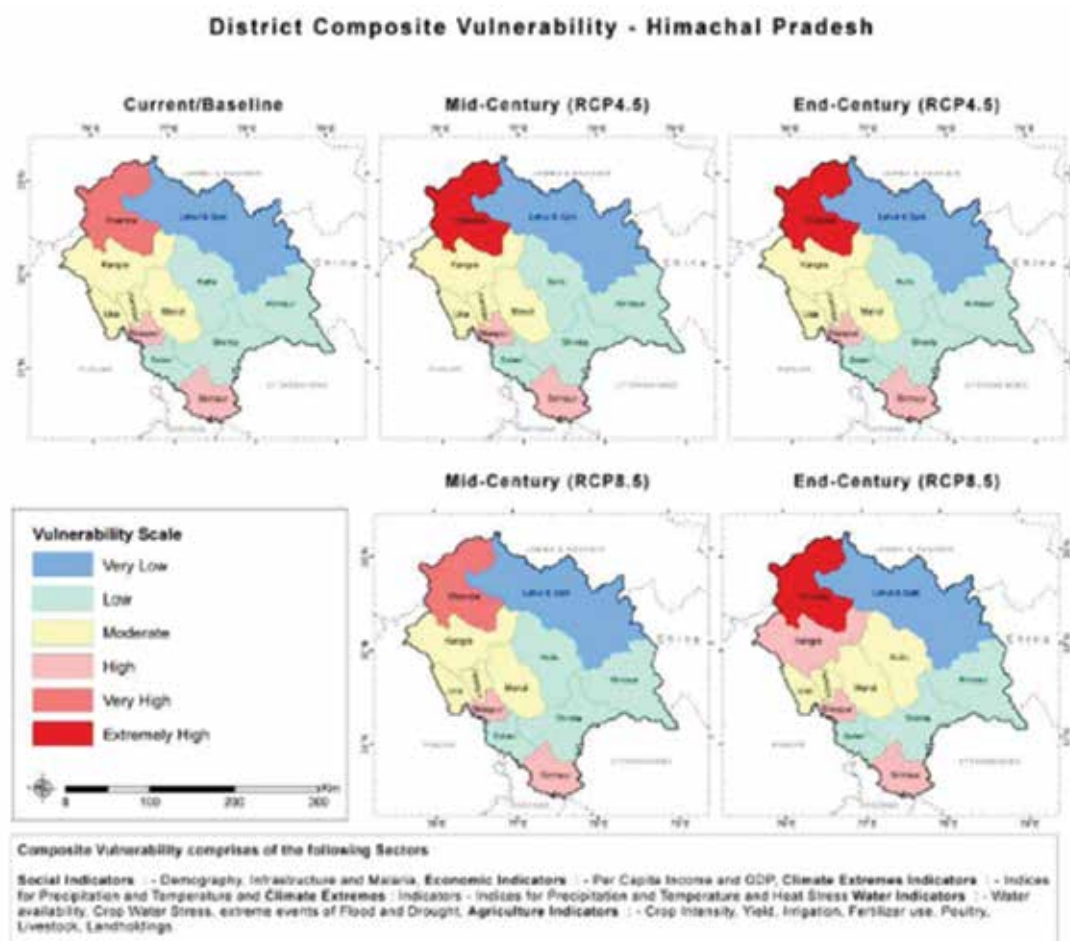
Increasing vulnerabilities due to climate change are multi-dimensional and interlinked. It is varying across location, sectors, communities, households and individuals (gender).

GIZ supported assessment of the vulnerability of all the 12 districts of Himachal Pradesh to climate induced risks, its sensitivity and adaptive capacity through computing Composite Vulnerability Index (CVI) of current and future climate change scenario (RCP 4.5 and RCP 8.5) of mid-century



using 62 indicators from social, economic, agriculture, water resources and health (extreme climate conditions) sectors explains that 1 district (Chamba) is in the category of very high vulnerable to climate risks; 2 districts (Bilaspur and Sirmaur) as highly vulnerable, 4 districts (Hamirpur, Kangra, Mandi and Una) as moderately vulnerable, 4 districts (Kinnaur, Solan, Kullu and Shimla) as low vulnerable; and 1 district (Lahaul & Spiti) as very low vulnerable.

**Figure 9.** District Composite Vulnerability in Himachal Pradesh



Source: Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP

The overall Composite Vulnerability of the Himachal Pradesh districts is projected to increase towards the mid-century and end-century as compared to the baseline for both the IPCC AR5 climate scenarios. District vulnerability is likely to exacerbate under RCP8.5 scenario as compared to RCP4.5 scenario towards end-century.

**Group discussion: Participants' experiences of felt climate change impacts in their villages (slide 6)**

- Ask the participants to group according to their home district (put a chart beforehand with names of districts under different agro-climatic region (see presentation 1.2 slide 7) and encourage the groups to discuss:
  - a. What are climate change impacts in that region?
  - b. What are geo-physical reasons (topography, spatial location, gradients/drainage, water conditions/regimes, etc.) that enhance the impact of climate change?
- After 10 min discussion ask the participants to present one example/story of how they have felt about climate change in the last 10 years (in terms of festivals, dress, marriage, timing of fruiting, etc.) to the other groups.

### Useful literature

- Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP. Available at: [https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf)

### Key take-aways

- At the end of this session, participants will be able to understand how climate change is impacting in different agro-climatic regions of HP

### Debriefing questions

- What are your important take-aways/ messages from the session?
- Which of the presented facts do you find most relevant for your situation?
- Did the session help you understand key climate impacts of different agro-climatic regions of HP? Are there any questions left unanswered?

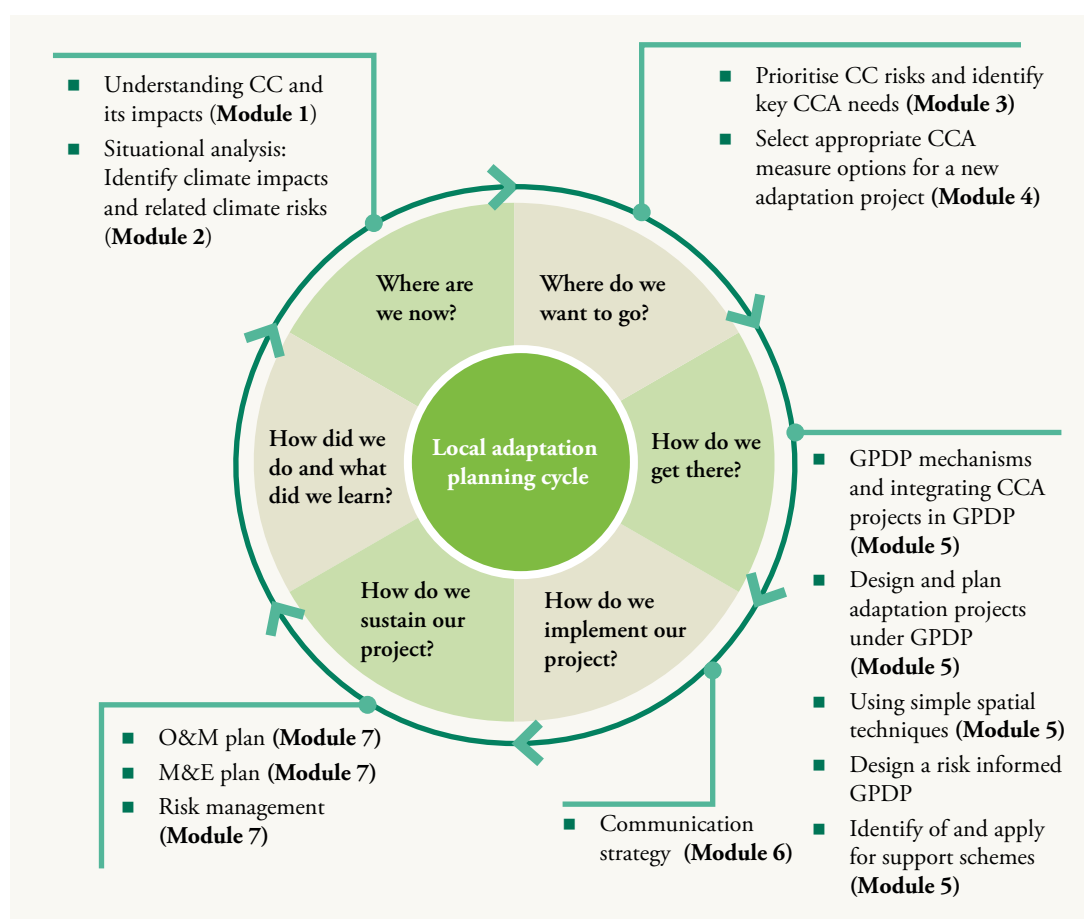


## Module 2. Climate change impacts and related risks

<b>Learning objective</b>	To understand and identify climate risks on the developmental activities related to agriculture and allied, water resources and disaster risk reduction (DRR) at gram panchayat (GP) level
<b>Duration</b>	Shortest version: 60 min Complete version: 4 h Potential complete version at the field level (including site visits): 6 h

### Module planner

Duration	Sessions of module	Shortest version	Complete version
60 min	Session 2.1 Experience sharing on impact of climate change interventions related to agriculture, water resources and DRR in the local context	×	×
2 h	Session 2.2 Assessing the impacts of climate change and identify related risks to the lives and livelihoods of rural communities		×



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## Integration of Module 2 along the local adaptation planning cycle

The methodology used by the Capacity Building Package follows the logical processes of local adaptation planning. The figure on the right shows the arrangement of the modules of the CDP, their main steps and methods employed. The yellow colour indicates that you are in Module 2 and Step 2 of the Local Adaptation Planning cycle, which guides participants to understand and identify climate risks to development activities related to agriculture and allied sectors, water resources and disaster risk reduction (DRR) at the Gram Panchayat (GP) level. Through the sessions of Module 2, the facilitator will motivate the participants to share their experiences on the impacts of climate change interventions related to agriculture, water resources and DRR in the local context and guide them to access the impacts and risks of climate change on the lives and livelihoods of rural communities. This will provide participants with important background knowledge that will help them identify their needs and CCA interventions in next modules. In the ExcelTool you will find a tab in the same yellow colour. Here you can document the results achieved by your group of participants in Module 2.

### Session 2.1 Experience sharing on impact of climate change on GDP interventions related to agriculture, water resources and DRR in the local context

This session will cater to the Phase-1 of the GDP development process, which focusses on environment building with communities.

Learning objective	To understand climate change impacts in different agro-climatic regions of HP and its impacts on the lives and livelihoods of rural communities (focusing on agriculture and allied, water resources and DRR)	
Prerequisites / prior knowledge for successful participation	Understanding of agriculture and allied, water resources and DRR	
Steps (duration)	<b>Step 1.</b> Apprising about climate change in Himachal Pradesh	40 min
	<b>Step 2.</b> Developing an understanding on climate impacts at infrastructure, natural resources and community level	20 min
Total duration	60 min	
Methods/Exercises	Input presentation; discussing experienced climate change variations and their impact on the infrastructure level, the natural ecosystem and the community in the villages of the participants	
Material	PowerPoint presentation 2.1, handout 2.1, Laptop, LCD Projector, white board, chart paper and markers	
Preparation of the material	You may prepare a list of questions focusing on what is affected, who is affected and when affected facilitating the group exercise in Step 2.	

### Step-by-step approach

This session will be divided into 2 steps:

In **Step 1** (Apprising about climate change in Himachal Pradesh), the participants will learn in detail about how the climate has changed over time at local level, what the major problems are associated with cropping patterns, the status of water resources and the nature of hydro-met disaster, and how all this relates to climate variability. Building on what they have learned, in **Step 2**, participants share their own experiences of how they are affected by climate change, looking at three different levels: Infrastructure, natural resources and community level.



## Step 1. Apprising about climate change in Himachal Pradesh

### Input presentation

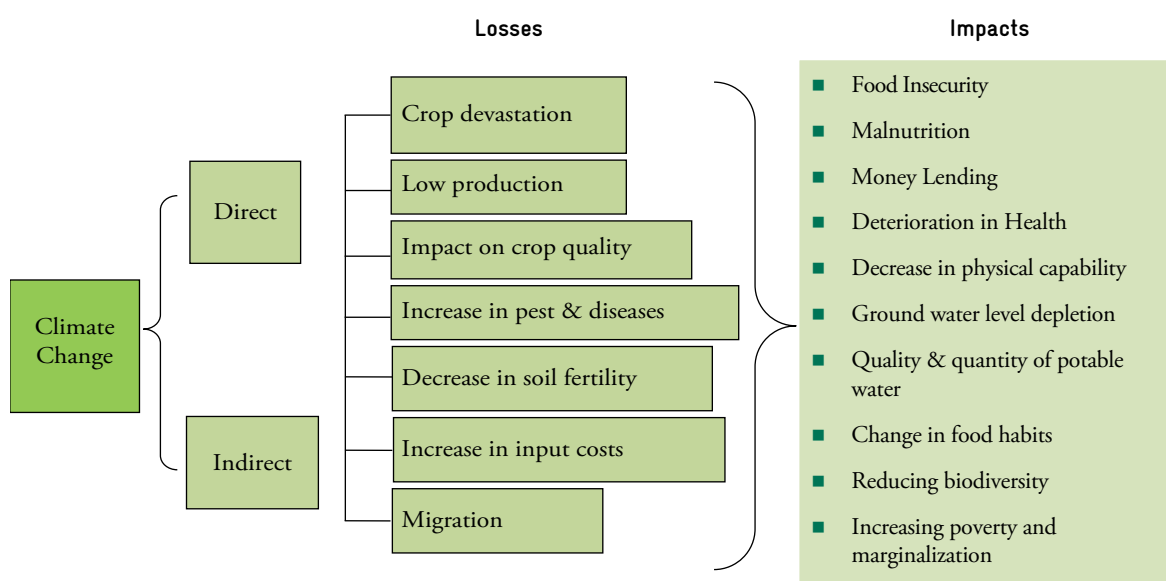
- Present slides 3-4 (presentation 2.1: Experience sharing on impact of CC) to the participants.

Increasing global temperature is the greatest challenge of the 21st century. Its impact is being felt all around the world with extreme weather events becoming more frequent and also more severe. Heat waves and drought plague many countries, destroying agriculture, increasing risk of wildfires and endangering lives. Rising sea level threatens coastal communities and infrastructure by amplifying flooding and storm surges.

Agriculture is one of the most important primary activities across the globe. It is the most basic economic activity which provides food grains, fruits, vegetables, nuts, other nutrients, natural fibre for clothing, fodder for livestock which provide milk, meat and various other ingredients, materials for the construction of houses, biofuel & medicinal products, and industrial raw material used to sustain and enhance human life. It is the most important sector for providing livelihood and employment opportunities to humans. Hence, it is also the most important sector for social transformation and socio-economic development of the society

Our food crops need specific conditions to thrive, which include the right temperature, humidity and sufficient water. Climate variability/change will affect agriculture and food supply in many ways. We are already observing more frequent floods (and waterlogging), droughts, storms causing challenges like scarcity of irrigation water, inundation and damages to standing crops, deteriorated quality of produced grains, increased pest attacks etc. Agriculture based livelihood comprises of horticulture, livestock rearing, agro-forestry which are also affected due to climate change and related disasters. Livestock also would be affected by an increase in temperature. It will affect their reproductive capability and also production of milk, meat and wool, as fodder availability will decrease, due to diminishing pasture lands and deforestation.

Figure 10. Impact of CC on Agriculture



Source: *The Vulnerability Source Book*, BMZ

Food security is both, directly and indirectly, linked with climate change. Any alteration in climatic parameters such as temperature and humidity, which govern crop growth, will have a direct impact on the quantity of food production. Indirect linkage pertains to catastrophic events such as floods &

droughts, which are projected to multiply as a consequence of climate change, leading to huge crop losses and leaving large patches of arable land unfit for cultivation, thereby threatening food security.

At the farmer's level, especially for the majority of small-marginal and women farmers, agriculture is a group of activities including horticulture, poultry, livestock, fisheries and so on which constitutes the farm systems. Climate change affects these sub-systems collectively for which adjustments amongst these elements are also made at the farmer level. Agriculture, therefore, is considered as comprising of allied activities like horticulture, agro-forestry, livestock, and poultry etc.

### Impacts of climate change on the agricultural sector in HP

The impact of climate change on agriculture, as already evident, varies in different agro-geo-ecological situations which gets affected adversely because of alterations in the amounts of rainfall and the timing of precipitation. This results in problems with food security and may threaten the livelihood activities upon which much of the population depends. Climate change can affect crop yields, shift cropping patterns, as well as the types of crops that can be grown in certain areas, by impacting agricultural inputs such as water for irrigation and the needed energy, as well as the prevalence of insects and pests.

Erratic and changing weather pattern have affected on the sustainability of marginal agriculture and horticulture in the State where average holding size is 0.95 ha and about majority of the population depends upon these two sectors for their livelihood. Over 89% of the holdings in the State are classified as small or marginal and dependence on rain in some areas is very high. Thus, when viewed along with other specificities such as infrastructure, rugged topography, limited land for cultivation, limited livelihood choices, low productivity of land, and vulnerability to natural disaster renders the state to be highly vulnerable to the phenomena of climate change- Rabi crops more affected due to erratic rainfall; Diversion from apple to vegetables especially in the Lower Kullu valley; Rise in temperature has affected the apple production especially located on the lower altitude.

With increasing temperatures, it is anticipated that there may be an all-round decrease in agricultural production in the region in long-term, and the line of production may shift to higher altitudes. Climate data from RCP 4.5 and RCP 8.5 indicates increase in extreme events: heavy rainfall, floods and droughts. These extreme events might fluctuate agricultural and horticulture production in the state. Vulnerability of agricultural workers especially with monoculture of wheat/maize, least diversification and low value addition are sensitive to climate variability adversely.

### Agriculture Vulnerability of Himachal Pradesh

**Very-high vulnerability:** Hamirpur, Kangra, Chamba and Kinnaur districts with ranks 12, 11, 10 and 9 respectively are currently very highly vulnerable.

Main contributing factors for high vulnerability of Hamirpur include low food grains yield, fertilizer consumption, irrigated area, egg production and livestock population while for Kangra includes low food grains yield, milk production and livestock population.

**High vulnerability:** Three districts namely, Shimla, Mandi and Kullu with ranks 8, 7 and 6 respectively fall under high vulnerability category.

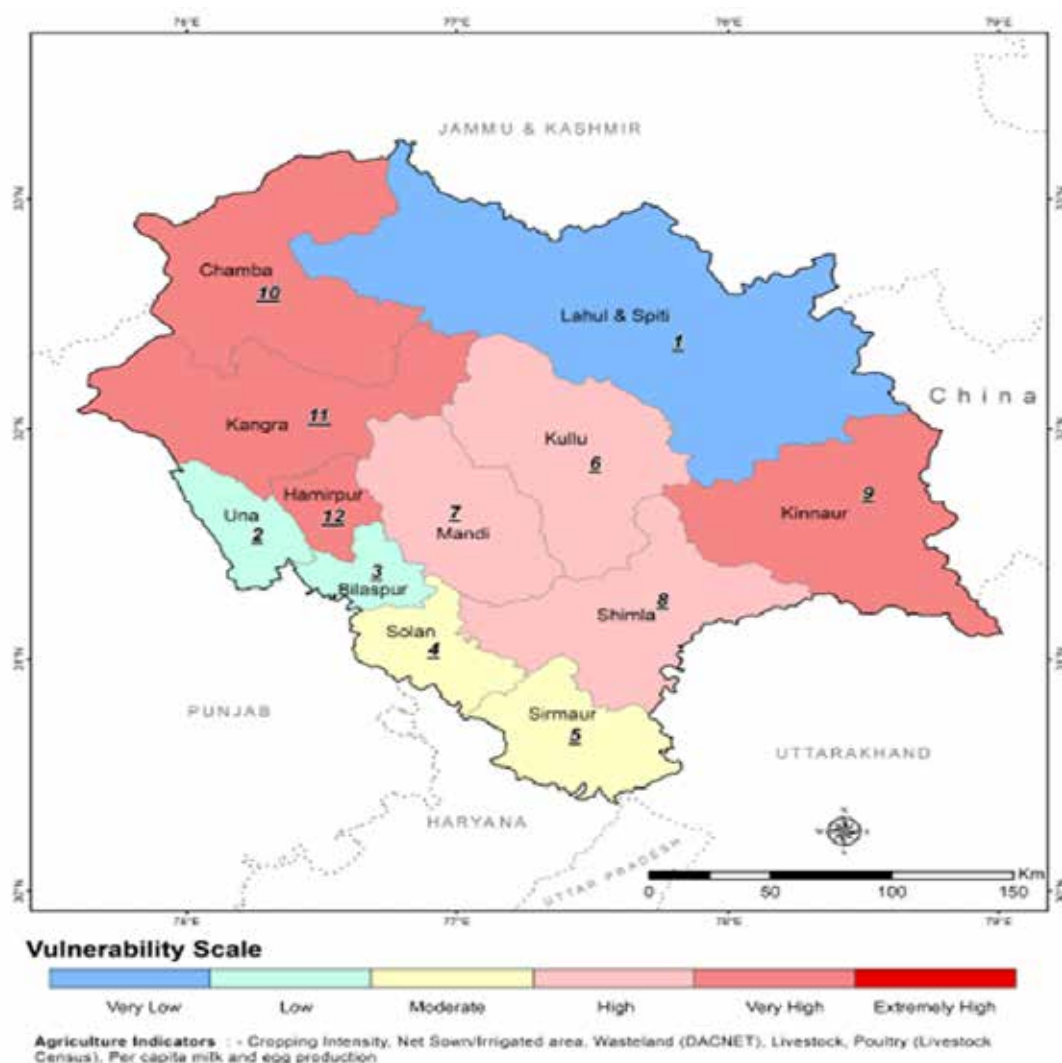
**Moderate vulnerability:** Districts namely, Solan and Sirmour with ranks 4 and 5 respectively have moderate vulnerability.

**Low vulnerability:** Two districts namely, Una and Bilaspur with ranks 2 and 3 respectively fall under low vulnerability category as can be seen in green colour in Figure 10.

**Very-low vulnerability:** District Lahaul & Spiti with rank 1 lying in very high hills temperate dry zone is the least vulnerable. High livestock population, milk and egg production per capita, food grains yield, fertilizer consumption and irrigated area contribute to render it least vulnerable.



Figure 11. Agricultural Vulnerability Himachal Pradesh



Source: Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP

### Impact of Climate Change on Forest

Forests provide many benefits and services to society, which includes a variety of forest products like timber, fodder, herbs, clean water & air, recreation, wildlife habitat and carbon storage. Climate influences the structure and function of forest ecosystems and plays an essential role in forest health. A changing climate may worsen many threats to forests, such as pest outbreaks, fires, human development and drought. Thus, the people who are dependent on forests for their farming inputs, grazing and also the minor produce get adversely affected.

### Group work: “My Village”

- Divide the participants in 4 groups and each group will deal with one question each as below (they can use the table on worksheet 1 of handout 2.1 to collect their results of the group work):

**Group-1:** Ask participants to brainstorm on their experiences of having felt the change in climate over the past several years. For this, ask them to list out main festivals celebrated by them across the year (at least 4 festivals to cover all 4 seasons). Ask the participants to write their observation on how the change in weather is being felt now in comparison to what it was 10-15 years ago.

**Group-2:** Ask the participants to list the problems that they come across in farming. Once listed, facilitate the participants to see which problems are connected with climate variability

**Group-3:** Ask the participants to list down water related problems in the village, for instance, waterlogging, water scarcity, quality issues, degrading underground water table, etc. Once listed, facilitate the participants to see which problems are connected with climate variability

**Group-4:** Ask participants to list down the major hydro-met problems in village, for instance, flash floods, long dry-spells/droughts, etc. Once listed, facilitate the participants to see which problems are connected with climate variability.

- Finally, ask the participants to present their group discussions in the plenary and see how all these four aspects are connected and have an influence because of climate variability.

Climate observations	Earlier			Now		
	Temperature	Rainfall	Humidity	Temperature	Rainfall	Humidity
Month						
Jan (Khichadi)						
Feb						
Mar (Holi)						
Apr						
May						
Jun						
Jul						
Aug (Janmashtami)						
Sep						
Oct (Dushara)						
Nov (Diwali)						
Dec						

## Step 2. Developing an understanding on climate change impacts at infrastructure, natural resources and community level

### Group exercise (slides 5-10)

Rural areas are prone to climate induced disasters due to their dependency on weather and primary production activities for their livelihoods. Observation records from macro to micro level have provided several evidences that climate change have negatively impacted the agriculture, food production, natural resources and livelihoods in rural areas. In this session, the participants will be guided to identify the impacts of climate change on infrastructure, natural resources and most importantly at community level with participatory way of interaction. In the Step 1, the participants have learned in detail about how the climate has changed at local level over the time, what are major problems associated with cropping pattern, status of water resources and the nature hydro-met disaster and how it is connected to climate variability.

- Now with this background information, ask the participants to recall the major hydro-met signature events (flood, drought, extreme rainfall, hot waves, cyclonic storm etc.) that have occurred in the respective regions of the participants over the last 5 years (it may be year wise) and write them on a white board in following tabular format. To collect their results, participants can use worksheet 2 of handout 2.1.
- Finally, ask the participants to compile the information for further reference and discussions.



	Major hydro-met disasters in the last 5 years
Year	Nature of signature disaster events
2020	
2019	
2018	
2017	
2016	

- With this initial information, divide the participants into three smaller groups of 5-10 persons for further discussion. They should be provided chart paper and markers and a list of questions (focusing on what is affected, who is affected and when affected) to discuss in their groups about the impact of disasters noticed over the last 5 years on the following three levels (example facilitating the discussion are given below):
  - At infrastructure level
  - At the natural resource level and
  - At community level
- Encourage each group to jot down inference of their discussion on the chart paper. To collect their results, participants can use worksheet 2 of handout 2.1
- Once all the groups have finished their assigned group task, invite them one by one to present their conclusive points. During the group presentation, encourage other group members to express their views on that particular subject and, ask the presenter to incorporate the points in their exercise sheet. Repeat the same process with other groups and then finally the facilitation should compile the information into the format of following table for further processing.

#### Impact of disaster on following three levels:

##### Disaster-1: Flood (Example)

What	Who/whose	When (Month)	How impacted
<b>Infrastructure level</b>			
Road	Village resident, especially vulnerable people e.g. women, children, elderly people	July, August	Submergence of low line roads, damaged, fully washed out, transport networks affected
Drains	Local drainage channels/ systems		Inundated/damaged
Electricity	Village resident mainly weaker groups who don't have any other option of electricity e.g. solar light etc.		Power supplies disrupted due to damage of electric polls
Houses	Village Resident, especially having those HHs who's having Kaccha House		No. of houses inundated, damaged (fully/ partially)
Buildings	Community buildings like AWC, Panchayat Bhawan, School etc.		No. of houses inundated, damaged (fully/ partially)

What	Who/whose	When (Month)	How impacted
<b>Natural Eco-System</b>			
Water bodies	Ponds, natural water streams etc.		Contaminated floodwater polluted the waterbodies
Natural vegetation	Trees, plants, scrubs etc.		Trees uprooted by high-velocity water flow, other vegetation also either washed out or destroyed
Groundwater level			Contamination of groundwater due to water logging
Open Land	Grazing land, common land etc.		Inundated, loss of grazing land
Agriculture Land	Farm field of villagers, Back yard land		Inundation, crop loss, silt and sediment destroyed crops on farms
<b>Community</b>			
People	Most vulnerable groups (socio-economic, gender, age, location etc.)		People injured or killed by flooding, services disrupted such as hospitals, schools etc., work load has been increased on women due to male migration, food in security, drinking water availability
Income	Agricultural labour		Unavailability of daily wags caused distress migration
Own land/ House	Village resident		House/property losses
Agriculture activities	HHs		Agricultural activities forced to shut down due to inundation in the farm field

### Useful literature

- Ministry of Panchayati Raj, Government of India (2018) GPDP Guidelines, Available at [https://gdpd.nic.in/resources/files/Rev\\_Booklet\\_on\\_People\\_Plan\\_Campaign\\_310802.pdf](https://gdpd.nic.in/resources/files/Rev_Booklet_on_People_Plan_Campaign_310802.pdf)
- BMZ (2014) The Vulnerability Sourcebook: Concept and guidelines for standardised vulnerability assessments
- Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP. Available at: [https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf)

### Key take-aways

- At the end of this session, participants will get an understanding on the impacts of climate change on their lives and livelihoods, on agriculture and water sectors and also the linkage between hydro-met disasters and climate change.

### Debriefing questions

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- How did the session and exercise support you in understanding climate change impacts and associated risks relevant to your work? Are there any questions left unanswered?



## Session 2.2 Assessing the impacts of climate change and related risks to the lives and livelihoods of village community

This session will cater to the Phase-2 of the GPDP development process which focusses on Situational Analysis of the Village.

Learning objective	To identify climate risks impacting in specific agro-climatic context on the lives and livelihoods of village community	
Prerequisites / prior knowledge for successful participation	Hands on experience and earlier participation in village development in specific agro-climatic setting	
Steps (duration)	Step 1. Identifying relevant climate hazards	30 min
	Step 2. Determining negative impacts of climate hazards	75 min
	Step 3. Identifying the risks of climate change impacts	15 min
Total duration	2 h	
Methods/Exercises	Identifying past and future climate hazards, transect walk, causal loop diagramme, creating a climate impact chain	
Material	PowerPoint presentation 2.2, handout 2.2, Laptop, LCD projector, flip chart, post its, markers, cards, transect walk video	
Preparation of the material	Prepare a transect walk video showing a common village to facilitate the exercise in Step 2 if time does not allow to do a physical walk through a village with the participants. You may adapt the examples given to facilitate the exercises of this session to the participants' contexts	

### Step-by-step approach

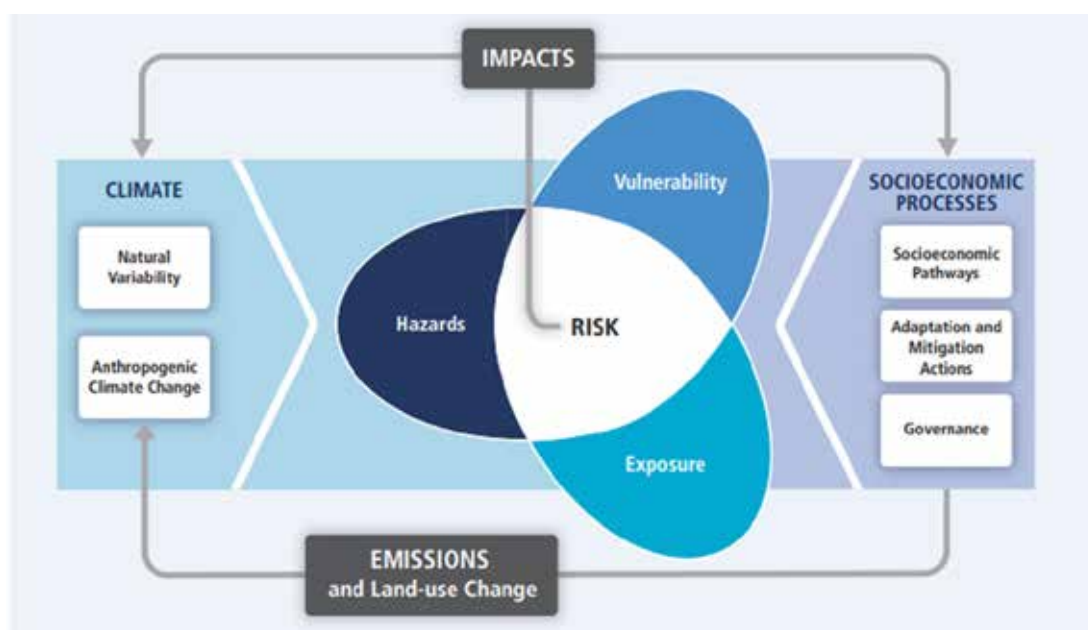
After learning about past and future climate hazards and the vulnerability of village communities in Module 1, participants are guided through the essential steps to determine their own climate impact chain and assess related climate risks for their own lives and work environment. In **step 1**, relevant climate hazards are identified, on the basis of which climate impacts are determined in the next **step 2**. Two approaches are used for this: First, the negative climate impacts are identified by assessing the exposure of different elements in one's own village as well as the exposure of different seasonal farm activities.

### Input presentation

- Present slides 3 (presentation 2.2 – Identifying climate impacts and related risks) to the participants.

The figure below shows the interrelationship of climate change risks/impacts at the intersection of hazards, vulnerability and exposure. The risk of climate-related impacts increases with increasing climate-related hazards (including hazardous events and trends) (left side of the figure) in relation to the vulnerability and exposure of human and natural systems. Socio-economic processes (right side of the figure) cause additional emissions and land use changes and can thus exacerbate climate change. On the other hand, socio-economic processes such as adaptation and mitigation measures can reduce vulnerability and exposure and thus reduce climate risk.

**Figure 12.** Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems.



Source: IPCC 2014

**Climate Impact:** consequences that result from the climate event or change or climate-related modifications of ecosystems. There are two types of impacts: direct impacts that are immediate consequences from climate change trends and events e.g., a greater number of drought events mean water scarcity and crop loss and indirect impacts that result from the direct impacts e.g. water scarcity leads to water borne diseases (human and livestock health), crop-loss leads to food insecurity & migration, indebtedness

**Risks:** The potential for consequences of hazards [= impacts] where something of value is at stake and where the outcome is uncertain.

The risk of climate-related impacts results from the interaction of climate-related hazards (=climate change trends and extreme events) with the vulnerability and exposure of human and natural systems. Risk = F (Hazard, Exposure, Vulnerability)

**Climate hazards:** A physical process or event resulting from climate change (e.g. heat, flooding, landslide) that cause negative impacts on people, their assets and their livelihoods.

**Exposure:** Who/what element is under threat/impacted by the hazard? Examples: smallholder farmers, village XY

**Vulnerability:** Why is the element susceptible to this threat? Examples: poverty, lack of knowledge; Vulnerability has two parts:

- Sensitivity: Attributes that determine whether/ how strongly a hazard will affect the element under consideration (e.g. drinking water availability, poverty, water quality).
- Capacity: Focusing on the a) Coping Capacity: Ability to respond to current / future hazards and b) Adaptive capacity: Ability to prepare for current / future hazards.



## Step 1. Identifying relevant climate hazards

### Input presentation

- Present slides 4-6 (presentation 2.2 – Identifying climate impacts and related risks) to the participants.

**Climate hazards:** A physical process or event resulting from climate change that cause negative impacts on people, their assets and their livelihoods.

Hazards include:

- climate signals, e.g. heavy rain, change in monsoon patterns, temperature increase;
- direct physical impacts of climate signals on geo-physical systems, e.g. flood, drought, sea level rise

India is particularly exposed to flooding (rivers and coasts), landslide, cyclones, water scarcity, extreme heat and wildfire (for more information see module 1).

### Participatory exercise

- Ask the participants to list climate hazards that they observed or anticipate as hazardous for their daily lives (e.g. frequent droughts, increase in dry spells, flooding, landslides, a greater number of hot days) and let them insert relevant climate hazard in the table below. To collect their results, participants can use worksheet 1 of handout 2.2
- If the participants get stuck, introduce them to local climate databases (for more information, find some recommendations for international databases at the end of the session.)
  - State Strategy and Action Plan on Climate Change: ([https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf))
  - State Centre on Climate Change, Himachal Pradesh (2021):
- Current scenarios: <http://www.hpccc.gov.in/currentscenario.aspx>
- Future projections: <http://www.hpccc.gov.in/futureprojections.aspx>
- In order to assess the relevance of the listed climate hazards (e.g. drought, floods, landslides, heatwaves, dry-spells), ask the participants to put in each column /for each selected climate hazard dots for the number of villages in their home district that have been highly impacted by the climate hazard
- Give some examples, in case the participants get stuck
- After completion, ask the participants to present and discuss their findings in plenary. Ask them to analyse what climate variations they could observe in their regions and villages in the near past and currently that negatively affected their lives and livelihoods. This can be a good basis to analyse future hazards.

#### Hints for the trainer:

- Keep in mind the chosen geographical scope as this will likely affect the range of climate-related hazards.

Year	Droughts (Example 1)	Rain/ Floods (Example 2)	Landslides (Example 3)	Heat waves (Example 4)	Add here other relevant climate hazards
20 years ago	•			•••	
10 years ago	••••	••		•	
Last year	••	•••••	•		•
This year		••••	••		
Anticipated for the future	•	•	•	•	

## Step 2. Determining negative impacts of climate hazards

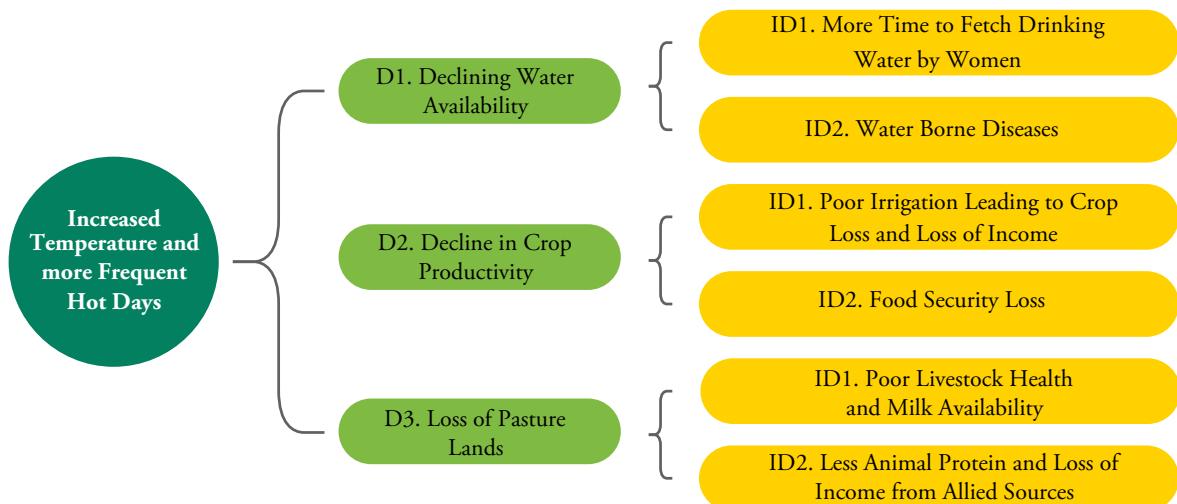
### Input presentation

- Present slides 7-11 (presentation 2.2 – Identifying climate impacts and related risks) to the participants to understand and identify negative impacts of climate hazards.

After past and future climate hazard in the regions of the participants have been identified, step 2 will guide the participants through two approaches to determine the negative climate impacts on their lives and livelihoods. With the help of the results of Step 2.1 and 2.2 the participants will be able to create their own climate impact chain (see example below). Depending on whether the participants want to develop adaptation measure(s) together as the goal of the whole training course (e.g. if they come from the same village), it may make sense to create a joint impact chain. In this case, to save time, the group can be divided into two groups so that the next Steps 2.1 and 2.2 can be conducted in parallel.

**Impact Chain:** A climate impact chain is a general representation of how a given climate trend effects directly and indirectly a system of interest.

### Example of an impact chain:



## Step 2.1 Identifying climate impacts by assessing elements under exposure to climate hazards

### Input presentation

**Exposure** is the presence of people, ecosystems, assets or other valuable elements in places that could be negatively affected by climate-related hazards. Hence, assessing exposure is about identifying people or things in your region that are / will be threatened by climate-related hazards.

### How to best identify and assess exposure

A large number of elements will be affected by hazards. Start with those that are of most value to you. Further exposure elements can be added later on.

In addition, a “**transect walk**” is highly recommended to help the participants identifying people or things in their regions that are / will be threatened by climate-related hazards. A transect walk is a walk-through of people in a given location to identify different places, people and their interaction with the environment and their experiences. This activity is usually done in a village setting and extremely useful for local level planning exercise like Gram Panchayat Development Plan (GPDP). In classroom, a prototype of the same can be attempted. Ideally, the facilitator may collect a 5 min video of a particular village if possible that can be shown to the participants during training.

### Examples of different elements that may be exposed / impacted by climate hazards:

Impacts of climate change include damages to infrastructure, village level services, production facilities or agricultural areas from floods, health impairment during heat waves drinking water for people and livestock etc.

Impact areas	Exposed elements	
Physical infrastructure	Electricity supply and communication	Damage to supply system and communication lines
	Roads	Transport of inputs & outputs
	Ponds	Drying of ponds, reduces stream flow, less water availability
Exposed stakeholders	Small & marginal farmers	Poverty and indebtedness
	Women & Children	Health and hygiene affected
Economic infrastructure	Markets	Access to market and opportunities of daily wages
	Financial institutions	Access to institutions

### Group exercise: The transect walk (slides 11-12)

- Ask the participants to watch the prepared video and evaluate the places shown from their village according to the following criteria (if the video shows another village, the participants should associate similar places from their village with the ones shown):
  - What is shown (people, objects) and
  - how are they exposed to climate change extreme weather events/change in resource availability)?
  - Guiding questions: How are households socio-economically affected by waterlogging or drought? How does water scarcity increase the cost of irrigation? How are forest dwellers, women affected (e.g. they need more time to fetch drinking water due to poor water availability).

- List the exposed elements/groups and the direct and indirect impacts (high, moderate, low) they face from climate change hazards, using worksheet 2 of handout 2.2. Focus on the climate hazards that were considered most relevant by the participants in Step 1.
- After completion, encourage the groups to present their results

**Hints for the trainer:**

- For the transect walk, ideally participants from the same village are grouped together. If there are too many different villages represented among the participants, take a video of one village as an example and apply it to all villages.

Climate hazard (insert the hazards identified in Step 1)	Settlement	Forest	Barren	Settlement	Home garden	Dense forest	Canal/kul
Extreme rain events	Direct impacts on the selected element: Flash floods, etc.	Direct impacts: ...					
	Indirect impacts: Damage to houses and infrastructure	Indirect impacts: ...					

**Step 2.2 Identifying climate impacts on the village and vulnerable groups**

- Present slide 13 (presentation 2.2 – Identifying climate impacts and related risks) to the participants.

**Group Exercise: The 3 Changes Exercise**

Causal Loop Diagrams are used to identify the primary, secondary and tertiary causes of a specific problem. It is a participatory tool where participants themselves identify the various reasons of the problem, which are directly or indirectly linked to the problem and its intensity. Although these factors may not directly link to the problem but it is important to address these factors for solving a specific problem on a sustainable basis.

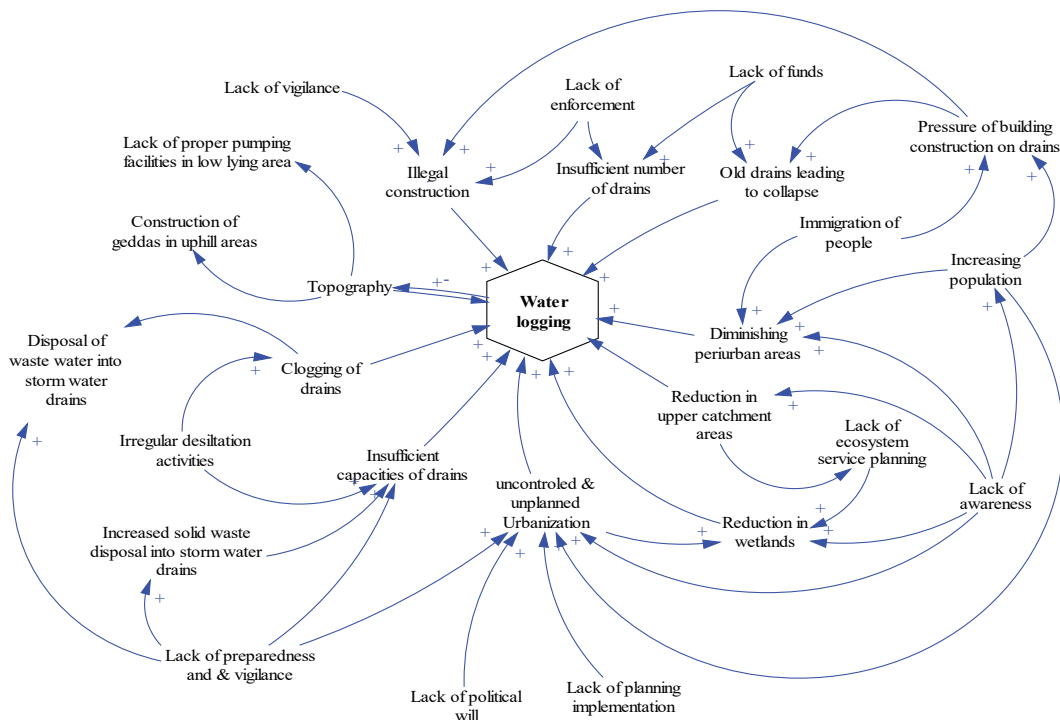
This exercise will provide an understanding to participants how climate change impacts have affected the village and a list of all the points (primary, secondary and tertiary causes) which are linked to climate change and need to be addressed in village development planning.

**Causal Loop Diagram** tool is one of the important tools in visualizing how different variables in a system are inter-related. The diagram consists of a set of nodes and edges. Nodes represent the variables and edges are the links that represent a connection or a relation between the two variables. A link marked positive indicates a positive relation and a link marked negative indicates a negative relation. A positive causal link means the two nodes change in the same direction, i.e., if the node in which the link starts decreases, the other node also decreases. Similarly, if the node in which the link starts increases, the other node increases as well. A negative causal link means the two nodes change in opposite directions, i.e., if the node in which the link starts increases, the other node decreases and vice versa. Several linked causes to a particular problem related was analyzed through this tool.



- Ask the participants to identify three most significant changes which community of the villages in the area have observed during last 10-15 years. For example, it may be following (or any other):
  1. Migration to cities (long term and short term)
  2. Major change in Cropping pattern
  3. Major change in water situation (stress, water logging, drying of waterbodies/streams etc.)
- Let the participants divide in 3 groups and each of the above 'change' assigned to a group.
- Ask the participants to identify what are the main reasons/causes of these problems (for example income, livelihood, health etc. for migration). This will identify the primary level of cause of the problem (migration).
- Now ask what is the cause of each of this first level of cause (secondary causes) for example income- reduced outputs in farming, livelihood- not much work in village etc.
- The same exercise to be continued for tertiary causes (of each of the secondary cause) for example reduced outputs in farming- lesser irrigation water, damages and losses in crops; not much work in village- agriculture labor work reduced due to machines, aquaculture not possible etc.
- Now let the participants discuss and see if any of these primary, secondary or tertiary causes are linked to climate change. Put a different color card on that cause and enlist all the causes that are linked to climate change. Also, discuss who (vulnerable groups) is most affected due to these problems and causes. Examples are given on worksheet 3 of handout 2.2.

### Example of a Causal Loop Diagram



## Step 3. Identifying risks on climate change impacts

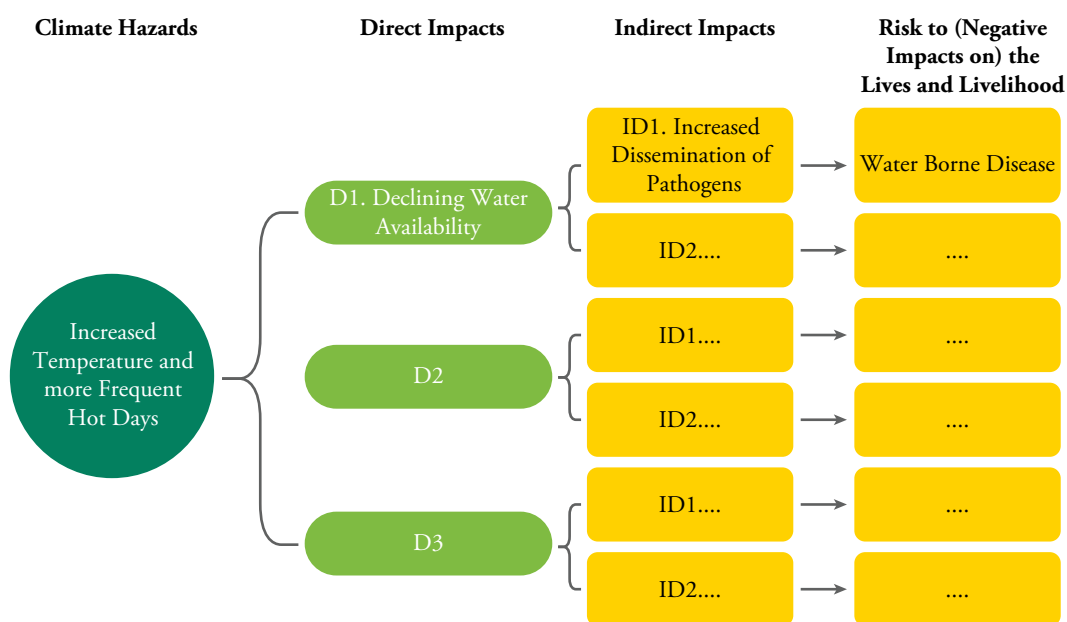
### Participatory exercise (slide 17)

Step 3 aims at identifying relevant climate risks to the lives and livelihoods of village communities under the determined climate change scenarios and impacts in Step 2.

- Ask the participants to insert their findings from Step 1 and Step 2.1 and 2.2 in the graphic below in order to create their own climate impact chain.
  - Select the most relevant climate trend or event they observed or anticipate for the future on the round field in worksheet 4 of handout 2.2 (use the prior discussed trends identified in module 1)
  - Ask the participants to use the rectangular cards to add direct impacts and indirect impacts of the selected climate trend as done in the impact chain example
- Finally, ask the participants to determine the climate risks to / negative effects on the lives and livelihoods of women farmers resulting from the identified climate impacts. Note: Depending on the indirect impacts identified, these may already be the negative effect for which adaptation strategies can be developed. In this case, reformulate the identified indirect impact or leave this column out.

#### Hint for the trainer

- When talking about hazards, instruct participants to focus not only on past hazards, but also to think about what the most important future climate variations/ hazards and their impacts/ risks might be in their village, neighbouring villages and the whole region.



#### Useful literature and databases

- IPCC, Climate Change (2014): Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: <http://www.ipcc.ch/report/ar5/wg2/>
- GIZ and EURAC (2017): Risk Supplement to the Vulnerability Sourcebook. Guidance on how to apply the Vulnerability Sourcebook's approach with the new IPCC AR5 concept of climate risk. Bonn: GIZ. Available at: [https://www.adaptationcommunity.net/wp-content/uploads/2017/10/GIZ-2017\\_Risk-Supplement-to-the-Vulnerability-Sourcebook.pdf](https://www.adaptationcommunity.net/wp-content/uploads/2017/10/GIZ-2017_Risk-Supplement-to-the-Vulnerability-Sourcebook.pdf)

- GIZ: Toolkit to develop climate adaptation strategies for small and medium-sized enterprises (SMEs): Climate Expert. Available at: <https://www.climate-expert.org/en/home/>
- Rural Agricultural Development Authority (RADA) of Jamaica: Adapting to climate change: a training manual for farmer. Available at: <https://rada.gov.jm/sites/default/files/documents/Adapting-to-Climate-Change-Farmer-Instruction-Manual.pdf>
- ActionAid (Village Book: Community led planning and development processes. A training manual. Available at: [https://actionaid.org/sites/default/files/village\\_book\\_training\\_manual\\_english\\_\\_0.pdf](https://actionaid.org/sites/default/files/village_book_training_manual_english__0.pdf)

#### Local climate databases:

- Department of Environment, Science & Technology Government of Himachal Pradesh (2012): State Strategy and Action Plan on Climate Change: ([https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf))
- State Centre on Climate Change, Himachal Pradesh (2021): Climate Change Scenario in Himachal Pradesh. Available at: <http://www.hpccc.gov.in/currentscenario.aspx>
- State Centre on Climate Change, Himachal Pradesh (2021): Future Climatic Projections. Available at: <http://www.hpccc.gov.in/futureprojections.aspx>
- International climate databases:
- World Bank Group: Climate Change Knowledge Portal providing global data on historical and future climate, vulnerability, and impacts. Available at: <https://climateknowledgeportal.worldbank.org/>
- World Bank Group: Historical data on CO2 Emissions. Available at: <https://data.worldbank.org/topic/climate-change>

#### Key take-aways

- Identifying climate impacts and risks are the starting point of local adaptation planning.
- Developing a climate impact chain that help understanding the physical climate hazards and experienced risks are interrelated.
- After the session, the participants should be aware of relevant risks their villages face from climate change as well as of most vulnerable places and people.

#### Debriefing questions

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- How did the session and exercise support you in understanding climate change impacts and associated risks relevant to your work?

#### Hints for the trainer

- Ensure that participants start with the same knowledge about fundamental concepts of climate change for successfully participating in the training
- The duration of the session can be adapted as needed. For example, it is recommended to spend more time in the on-field work (e.g. a transects walk can ideally take 1-1.5 h)



## Module 3. Climate change adaptation needs

<b>Learning objective</b>	To prioritize identified climate risks and evolve CCA needs of village communities to be addressed first
<b>Duration</b>	Shortest version: 20 min Complete version: 3 h 20 min

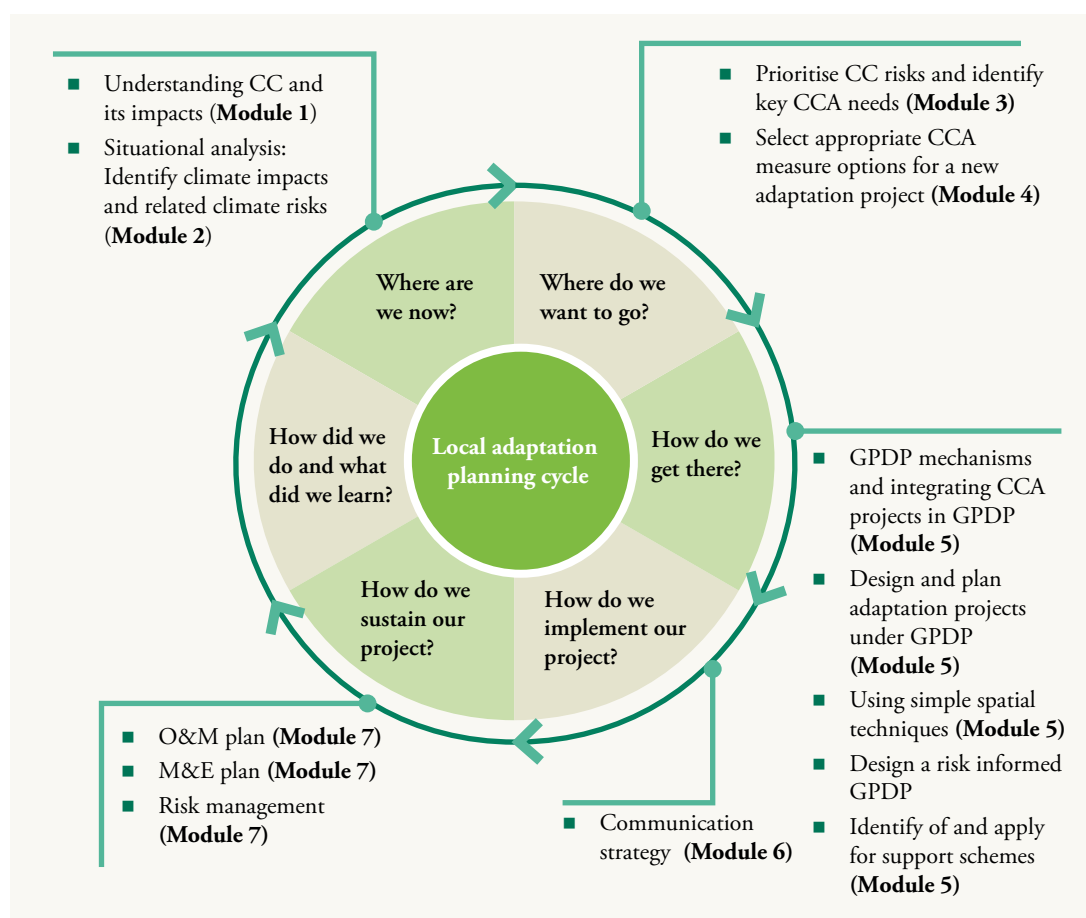
### Module planner

Duration	Sessions of module	Shortest version	Complete version
20 min	Session 3.1 Recently conducted needs assessment	×	×
45 min	Session 3.2 Prioritising identified climate risks		×
120 min	Session 3.3 Defining climate change adaptation needs		×

### Integration of Module 3 along the local adaptation planning cycle

The methodology used by the Capacity Building Package follows the logical processes of local adaptation planning. The right Figure shows the arrangement of the modules of the CDP, their main steps and methods employed. The colour orange indicates that you are in Module 3 and Step 3 of the Local Adaptation Planning cycle, which provides different methods for working with PRI-members to assess their climate change adaptation needs. The sessions in this module will include the results of a recent needs assessment, the prioritisation of climate risks and identification of adaptation need. This will enable participants to identify and assess locally adapted CCA measures in module 4.

In the ExcelTool you will find a tab in the same orange colour. Here you can document the results achieved by your group of participants in module 3.



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## Session 3.1 Recently conducted needs assessment

<b>Learning objective</b>	To be informed on recently conducted needs assessment study and identified adaptation needs for PRI members
<b>Prerequisites / prior knowledge for successful participation</b>	Hands on experience in climate resilient village developmental activities
<b>Total duration</b>	20 min
<b>Methods/Exercises</b>	Input presentation
<b>Material</b>	PowerPoint presentation 3.1, handout 3.1, Laptop, LCD projector

- Present slide 3 (presentation 3.1: Recently Conducted Needs Assessment) to the participants.

The Scoping Assessment in Himachal Pradesh and field experiences indicate that the climate resilience of PRI Members with focus on GPDP-Agriculture+, Water Resources and DRR, need several interventions which can be grouped as follows. The adaptive measures will need to be evolved in consultation with PRI members in the specific agro-climatic context:

- Participatory climate risk analysis and the identification of mitigation and adaptation actions that can be leveraged through MGNREGS resources (e.g. plantation, drainage improvement, check dams, waterbodies)
- Linking disaster risks to the planning process
- Identifying activities under relevant schemes and programmes of GPDP concerning Agriculture and allied, Water Resources and DRR, which has scope of CC integration and expected climate benefits (developing a glossary) including creation of resilient infrastructures
- Use of technology for NRM related planning process
- Integration of CC components into Gram Panchayat Development Plans. Developing (CC-Disaster) risk informed GPDP
- Capacities at Gram Panchayat level to be developed for maintaining GIS based Database generation on groundwater level, rainfall and water quality for water budgeting and preparation of water security plan (esp. in drought prone areas)
- Integration of natural resource management for long term GPDP planning
- Capacity building on disaster resilient agriculture and water management techniques

### Useful literature

- adelphi & CTRAN (2021): Need Assessment Report of Himachal Pradesh (available on request from GIZ)

### Key take-aways

- Participants will be provided with an overview of identified key adaptation needs of PRI-members in Himachal Pradesh.

## Session 3.2 Prioritising identified climate risks

<b>Learning objective</b>	To assess and prioritise key climate risks identified in Module 2 based on determined climate impacts	
<b>Prerequisites / prior knowledge for successful participation</b>	Basic understanding of climate change scenarios and their impacts. Climate risks are identified (Module 2, Session 2.2.)	
<b>Steps (duration)</b>	<b>Step 1.</b> Understanding prioritisation methodology	5 min
	<b>Step 2.</b> Prioritizing identified climate risks	
	<b>Step 2.1</b> Assessing probability and time horizon	15 min
	<b>Step 2.2</b> Assessing vulnerability of the exposed elements	15 min
	<b>Step 3.</b> Comparing final scores of assessed risks	10 min
<b>Total duration</b>	45 min	
<b>Methods/Exercises</b>	Prioritising identified risks with a probability-time horizon matrix and sensitivity-capacity matrix	
<b>Material</b>	PowerPoint presentation 3.2, handout 3.2, Laptop, LCD projector, flip chart, post its	
<b>Preparation of the material</b>	You may prepare some examples and hints to facilitate the group exercises. Support the participants conducting the risk assessment with available literature and regional studies. Seek expert advice when necessary and possible to validate assessments and clarify assumptions.	

### Step-by-step approach

In this session, participants assess and prioritise the key climate risks identified in Module 2, guiding them through different aspects and participatory exercises (Step 1). The prioritisation is done under the criteria of probability and time horizon (Step 2) and sensitivity and coping capacity (Step 3) of the climate hazard and impacts on the target group. A final summary matrix (Step 4) gives participants a basis for developing further steps to adapt to climate change.

### Step 1. Understanding prioritisation methodology

#### Input presentation

- Present slides 3-5 (presentation 3.2: Prioritise identified climate risks) to the participants

Before deciding on adaptation measures (Module 4), it is important to compare and prioritise the identified climate risks according to their relevance for the participants.

Risks do not have the same relevance and urgency to act upon them as there is always uncertainty involved when estimating the impacts of climate change. The relevance of the risks depends on:

- **The probability:** how likely it is that the identified climate hazard occurs?
- **The time horizon:** when does or is the hazard and negative impact expected to occur? Which of the identified climate risks arise from past/current climate variations, and which are expected to arise from future climate variations?
- **The vulnerability:** how vulnerable are the exposed elements to the climate hazards?

**For example,** if the probability of a drought and the vulnerability of the crops are high and impacts are already observed now, i.e. farmers already face crop and harvest loss and resulting lower production levels. Therefore, the climate-related risk from droughts require immediate attention for example through the implementation of soil water conservation measures.



The proposed assessment provides a targeted approach for the subsequent design and selection of appropriate adaptation measures.

## Step 2. Prioritizing identified climate risks

### Participatory exercise

- The facilitator should prepare prior identified climate risks for women farmers from the session 2.1.4 and 2.2 step 3 written on cards and pin them on a flipchart, so they can be used in this session. A short discussion round can be held so that the group remembers what was previously identified and is aware of their climate impact chain (hazards that occurred and the climate impacts/risks caused).
- For each of the risks identified in Module 2, ask the participants to assess their relevance by reflecting
  - Step 2.1: the probability and the time horizon of occurrence
  - Step 2.2: the vulnerability of the exposed elements / persons to the climate risk
- They can use worksheets 1-2 (handout 3.2).

#### Hints for the trainer:

- As the assessment of risks is always fraught with uncertainty, it is crucial to ask the participants to make uncertainties and personal assumptions transparent within the assessment. This helps them to validate made assumptions and decision taken in future.
- Be aware of the following psychological biases during the risk assessment: Often risks from personal experience which are particularly engrained in memory are over-estimated. For example, personal loss experienced during a storm. Orientate yourself more closely to the facts during the risk analysis.

## Step 2.1 Assessing probability and time horizon

- Prepare the matrix below on a flipchart or draw it on the ground depending on the setting.
- Ask the participants to define
  - If there is a low, medium or high probability that the impact occurs and
  - The time horizon for the climate hazard causing the identified risk (observed now, expected in 5 or 10 years).
- Depending on the answers let the participant place the climate risk cards (that have been prior prepared) on the matrix.
- Go through the assessment process for all risks relevant to the participants. Final results will be compared in Step 3 of this session. As this exercise is time-consuming, it is recommended to ask the participants to assess not more than 3 selected, relevant risks.
- The participants can note their results using worksheet 1 of handout 3.2.

#### Guiding questions:

- **Probability:**
  - How likely it is that the identified climate hazard impact occurs?
  - Ask the participants the last time climate hazard occurred and what kind of impact it caused: was it always the same? When was the impact more or less severe?
- **Time horizon:**
  - When does or is the hazard and it's negative impact expected to occur?
  - When was the last time it occurred and before that?
  - What could be signals of this hazard?

High probability	Immediate attention required	Immediate attention required	Attention required in the next years
Medium probability	Immediate attention required	Attention required in the next years	Caution over the long term
Low probability	Attention required in the next years	Caution over the long term	Caution over the long term
	Impacts observed now	Impacts expected in next 10 years	Impacts expected mid-century

## Step 2.2 Assessing vulnerability of the exposed elements

### Participatory exercise

**Vulnerability** has two elements:

- **Sensitivity:** Attributes that determine whether/ how strongly a hazard will affect the element under consideration. One way of determining the damages caused by impacts is trying to quantify the possible damage in monetary values (Indian Rupees), e.g. how much would it cost to repair the damages done to the houses by flooding?
- **Capacity:** Focusing on the ability to respond to current / future hazards (in terms of knowledge/ skills, technology, financial/economic)

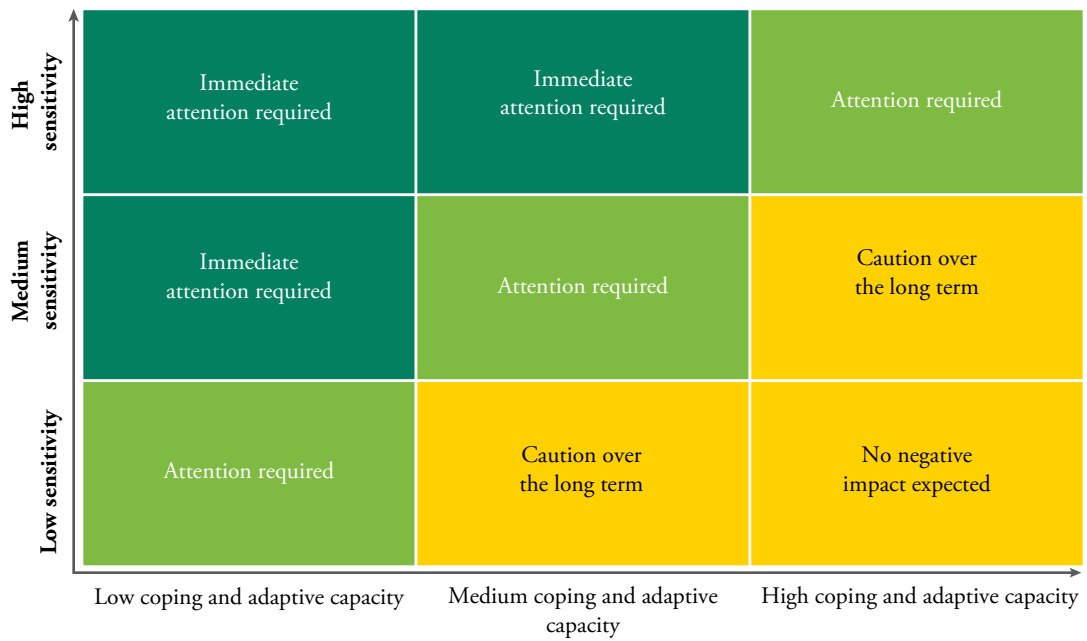
Ask the participants to follow the same instructions as before:

- Prepare the second matrix below on a flipchart or draw it on the ground depending on the setting.
- Ask the participants to define
  - If there is a low, medium or high sensitivity to the impacts and
  - if they have a low, medium or high coping and adaptive capacity
- Depending on the answers let the participant place the climate risk cards (that have been prior prepared) on the matrix.
- Go through the assessment process for all risks relevant to the participants. Final results will be compared in Step 3 of this session. As this exercise is time-consuming, it is recommended to ask the participants to assess not more than 3 selected, relevant risks.
- The participants can note their results using worksheet 2 of handout 3.2.

#### Guiding questions:

- **Sensitivity:**
  - How vulnerable are you to the impact of the climate hazards?
  - What strong are the negative impacts after a climate hazard?
- **Coping/adaptive capacity:**
  - How well can you manage/are you prepared to the impacts of climate hazards?





**Note:** In case the participants assessed the vulnerability of more than one exposed element, calculate the final vulnerability score by: Sum vulnerability scores / number of exposed elements

### Step 3. Comparing final scores of assessed risks

#### Participatory exercise

- After having rated identified climate risks in Step 2 and 3, ask the participants to insert their results in the table below by noting down the following scores:

Scoring legend:

- red area = score 5
- light red area = score 3
- grey area = score 1
- white area = score 0

- Encourage the participants to present and discuss their findings to/with the group.

Climate risks	Probability	Time horizon	Vulnerability		Final score
			Sensitivity to the climate hazard	Vulnerability of the exposed elements	
Risk 1: Small and marginal farmers facing water stress					
Risk 2: ...					

## Useful literature

- GIZ: Toolkit to develop climate adaptation strategies for small and medium-sized enterprises (SMEs): Climate Expert. Available at: <https://www.climate-expert.org/en/home/>
- GIZ and EURAC (2017): Risk Supplement to the Vulnerability Sourcebook. Guidance on how to apply the Vulnerability Sourcebook's approach with the new IPCC AR5 concept of climate risk. Bonn: GIZ. [https://www.adaptationcommunity.net/wp-content/uploads/2017/10/GIZ-2017\\_Risk-Supplement-to-the-Vulnerability-Sourcebook.pdf](https://www.adaptationcommunity.net/wp-content/uploads/2017/10/GIZ-2017_Risk-Supplement-to-the-Vulnerability-Sourcebook.pdf)
- IPCC, Climate Change 2014: Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: <http://www.ipcc.ch/report/ar5/wg2/>

## Key take-aways

- Risks do not have the same relevance and urgency to act upon them as there is always uncertainty involved when estimating the impacts of climate change.
- The relevance of the risks depends on: the probability of occurrence, extent and time horizon of the climate hazard and thus climate impacts, and the vulnerability of the exposed elements.

## Debriefing questions

- What are your important take-away messages from this session?
- How did the tool support you in identifying the most relevant climate risk for your local context?

## Session 3.3 Defining climate change adaptation needs

<b>Learning objective</b>	To identify climate adaptation needs at PRI level to address the identified climate risks.	
<b>Prerequisites / prior knowledge for successful participation</b>	Hands on experience on various developmental works done by PRIs at village level	
<b>Steps (duration)</b>	<b>Step 1.</b> Identifying CCA needs of village communities related to human development and social security	60 min
	<b>Step 2.</b> Identifying CCA needs of village communities related to structures, environment and disaster management	30 min
	<b>Step 3.</b> Identifying CCA Needs of village communities related to Income, employment and economic aspects	30 min
<b>Total duration</b>	120 min	
<b>Methods/Exercises</b>	Defining climate change needs for identified risks on different levels	
<b>Material</b>	PowerPoint presentation 3.3, handout 3.3, Laptop, LCD projector, chart papers, markers, cards	
<b>Preparation of the material</b>	You may adjust the given examples and hints for the group exercises to the participants contexts	

## Step-by-step approach

This session will be divided into 3 steps:

In **Step 1**, the participants will learn to assess the needs on various sectors related to human development and social security on the basis of climate change impacts on those sectors. Similarly, in **Step 2**, participants will assess the CCA needs on those aspects that are related to infrastructure, ecosystems and environment. In **Step 3**, they will learn to assess the CCA needs of village communities related to income, employment and economic aspects.



## Step 1. Identifying CCA needs of village communities related to human development and social security

- Present slides 3-6 (presentation 3.3 - Defining climate change adaptation needs) to the participants

Climate induced disaster affects human development and social security issues. In the previous sessions, participants learned about the key issues of climate change and its impacts at macro and micro level. They also learned how the changing climate and its variabilities have affected the livelihood of poor and marginalised community, natural resources and infrastructure at village level. In this session, the focus of the discussion will be to understand and identify the needs of the village communities related to human development and social security, strategy to achieve that needs and appropriate actions that are needed at individual and community level to mitigate the impacts of climate change and hydro-met disasters. Before starting the group work of Step 1, encourage the participants to recap the learning of the previous sessions.

### Group Work

- Divide participants into following four thematic groups.
  - Water resources (source, hand pumps etc.)
  - Hygiene and sanitation (toilets- individual, community, waste management: solid, liquid etc.)
  - Health & nutrition (diseases, facilities and related infrastructure etc.)
  - Education (schools, attendance, girl's education etc.)
- Provide key hint points to the participants and support the participants to find out the impacts of climate change at village level and what actions are needed. They should be also provided with chart paper and markers for listing out the final inferences. To collect their results, participants can use worksheet 1 of handout 3.3.
- Once all the groups have finished their assigned task, invite them one by one to present their conclusive points. During the group presentation, encourage other group members to express their views on that particular subject and, ask the presenter to incorporate the points in their exercise sheet. Repeat the same process with other groups and then finally compile the information into the format of following table for further processing.

**Few examples for hints and facilitation are given in below table:**

**Table 3.** Examples of CCA needs of village communities related to human development and social security

		<b>Impacts due to CC (flooding, waterlogging, drought, ground water depletion)</b>	<b>CCA Needs</b>
<b>Water Resources</b>	Pond/ water bodies	<ul style="list-style-type: none"> <li>In flood prone areas, with extreme events cause inundation in surrounding low-lying areas while in drought prone areas lack of water bodies/ ponds reduces ground water recharge and means of irrigation</li> </ul>	<ul style="list-style-type: none"> <li>Quick draining out of water from inundated field,</li> <li>Ensure ground water recharge</li> </ul>
	Hand Pumps	<ul style="list-style-type: none"> <li>Submerge during flood, Dry during summer</li> </ul>	<ul style="list-style-type: none"> <li>Ensure safe drinking water availability throughout the year especially during the stress period</li> </ul>
	Fresh water wells	<ul style="list-style-type: none"> <li>Water contamination and siltation due to flood water, Dry due to depletion of ground water table in drought prone areas,</li> <li>Damage of shoreline during flood</li> </ul>	<ul style="list-style-type: none"> <li>Ensure repair and Maintenance,</li> <li>Ensure ground water recharge</li> </ul>
<b>Hygiene and Sanitation</b>		<ul style="list-style-type: none"> <li>Access to safe drinking water gets affected</li> <li>Deterioration of drinking water quality</li> <li>Depletion of water or access to water in drought prone areas affects personal hygiene</li> <li>Toilet gets defunct in water inundated and water stressed areas</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring access to safe drinking water, disposal of garbage, access to water for toilet</li> </ul>
<b>Health &amp; Nutrition</b>		<ul style="list-style-type: none"> <li>Clogging of water and Intake of contaminated water causes vector and water borne diseases in children</li> <li>Health systems/services disrupted due to flood, Damage of crops affects food security,</li> <li>Cases of malnutrition in children and women increases</li> </ul>	<ul style="list-style-type: none"> <li>Ensure proper functioning of health centers, PDS system, Ensure uninterrupted health services during the disaster</li> </ul>
<b>Education</b>		<ul style="list-style-type: none"> <li>Damage or inundation of school's building and other infrastructure due to extreme events rainfall or flood.</li> <li>Access to school affected</li> <li>Enrollment of children in school reduces</li> <li>Continuity of school days interrupted</li> <li>Attendance of children in school affected.</li> <li>Dropout increases</li> </ul>	<ul style="list-style-type: none"> <li>Ensure uninterrupted functioning of school,</li> <li>Ensure access to safe drinking water, toilet for children,</li> <li>Ensure all season road connectivity, Ensure safety and security measures</li> </ul>



## Step 2. Identifying CCA needs of village communities related to structures, environment and disaster management

- Present slides 7-10 (presentation 3.3 - Defining climate change adaptation needs) to the participants

The socio-economic disruption and environmental degradation caused due to weather extremes are leading to substantial loss of life and property. In the previous steps, participants learned about the CCA level actions at the level of village communities in relation to human development and social security for mitigation of the impact of climate induced hazard on water resources, sanitation, education and health. In this step, the participants will be trained on identification of the CCA needs of the village communities for mitigation of the impact of climate induced hazards on village infrastructure and environment/natural resources/ ecosystem services.

### Group exercise

- Encourage the participants to recap the learning of the previous sessions and extend the group work exercise by grouping the participants into following two thematic groups:
  - Village Infrastructure
  - Environment/Natural Resources/Ecosystem Services
- Provide key hint points to the participants and support the participants to find out the impacts of climate change at village level and what actions are needed.
- In addition, provided the participants with chart paper and markers to the participants for listing out the final inferences. To collect their results, participants can use worksheet 2 of handout 3.3.
- Once all the groups have finished their assigned group task, invite them one by one to present their conclusive points. During the group presentation, encourage other group members to express their views on that particular subject and, ask the presenter to incorporate the points in their exercise sheet. Repeat the same process with other groups and then finally compile the information into the format of following table for further processing.

Few examples for hints and facilitation are given in below table:

**Table 4.** Examples of CCA needs of village communities related to structures, environment and disaster management

Thematic Group	Impacts due to CC (floods, drought etc.)	Current Status	Required Status	Needed Action
Village Infrastructure	<ul style="list-style-type: none"> <li>■ Rainfall erosion, wave erosion accompanied by heavy traffic over embankments passing through village may cause its failure-especially in monsoon or flood season</li> <li>■ Gram Panchayat bhawan and Anganwadi centers often gets damage, owing to its presence at low lying level</li> </ul>	<ul style="list-style-type: none"> <li>■ Length of embankment passing through the village</li> <li>■ Condition of Gram panchayat bhawan and Anganwadi centers</li> <li>■ Number of wet lands, farm ponds</li> </ul>	<ul style="list-style-type: none"> <li>■ Strengthened embankments free from any failure</li> <li>■ Cleaned creeks and culverts in pre-flood season</li> <li>■ Maintained and functional panchayat bhawans</li> <li>■ Transformers and HT cables located at distant away from village infrastructures</li> </ul>	<ul style="list-style-type: none"> <li>■ Ensure minute level monitoring of embankments for determining any failure and maintenance of the same by ensuring follow up by VDMC in liaising with respective DDMA</li> </ul>

Thematic Group	Impacts due to CC (floods, drought etc.)	Current Status	Required Status	Needed Action
	<ul style="list-style-type: none"> <li>Transformers installed at low elevation gets short circuited and causes damage to nearby equally elevated structures like school buildings, GP bhawan, community meeting halls</li> <li>High tension pole wire many a times get short circuited in lightning, cyclone or rainfall and fell down among the passerby communities</li> <li>Creeks &amp; culverts get choked in flood and heavy rainfall</li> <li>Village roads get damaged in flood and rainfall</li> </ul>	<ul style="list-style-type: none"> <li>Number of transformers installed at low elevation and close to schools, GP bhawan, marriage centers etc.</li> <li>Number of high-tension wire passing close to children or community focused infrastructures like school, meeting halls, large tree shade foundations etc.</li> <li>Number of creeks and culverts</li> <li>Number of roads getting damaged frequently in monsoon</li> </ul>		<ul style="list-style-type: none"> <li>Restoration &amp; shifting of public gathering infrastructures affected due to climate hazards at higher level in the village</li> <li>Shifting of transformers and HT wire/ cables at distant away from public gathering infrastructures like schools etc.</li> <li>Periodic cleaning of creeks and culvers in pre-flood season</li> <li>Properly maintained roads</li> </ul>
<b>Environment/ Ecosystem and Natural Sources</b>	<ul style="list-style-type: none"> <li>Wet lands, ponds get dried up in drought</li> <li>Depleted groundwater level in drought</li> <li>Destruction of trees and green infrastructures post storm or cyclone</li> <li>Damaging of compost pits and farm land with excessive mud deposition post flood</li> </ul>	<ul style="list-style-type: none"> <li>Number of wet lands and pond</li> <li>Number of recharge wells</li> <li>Presence of mature green infrastructures like plants, trees etc. at village level</li> </ul>	<ul style="list-style-type: none"> <li>Ensure maintenance of pond, wells etc.</li> <li>Regular monitoring of groundwater level with no reduction in water level.</li> <li>Increase of green infrastructures like trees, flowering plants etc. on yearly basis in the entire village</li> </ul>	<ul style="list-style-type: none"> <li>Applicability of measures for groundwater rechargeability, rainwater harvesting and maintenance of pond, wet lands, wells etc.</li> <li>Monitoring and maintenance of green infrastructures across the village</li> </ul>



Thematic Group	Impacts due to CC (floods, drought etc.)	Current Status	Required Status	Needed Action
				<ul style="list-style-type: none"> <li>■ Identification of farm land located at low level for ensuring its regular maintenance and cleaning post flood and granting of needed ex-gratia assistance. The process must be done in supervision of VDMC.</li> </ul>

### Step 3. Identifying CCA needs of village communities related to income, employment and economic aspects

- Present slides 11-13 (presentation 3.3 - Defining climate change adaptation needs) to the participants

Climate change and induced disasters affect the income and employment aspects of people, which has a direct bearing on their economic situation. In this step, discussion will be focused on identifying the needs of the village communities related to various sectors that contribute to income and employment such as agriculture, livestock, horticulture (including medicinal plants) and skill-based livelihoods.

#### Group exercise

- Divide the participants in 4 groups and ask them to work for any one village (few examples are given below).
  - Agriculture (including irrigation, agro-forestry)
  - Livestock
  - Horticulture (incl. Medicinal Plants)
  - Skill based self-employment
- To collect their results, participants can use worksheet 3 of handout 3.3.

#### Hint for the trainer:

- A 2-hour visit may be organized to assess the situation in any village.

Few examples for hints and facilitation are given in below table:

**Table 5.** CCA needs of village communities related to income, employment and economic aspects

	<b>Impacts due to CC (flooding, waterlogging, drought, ground water depletion)</b>	<b>CCA Needs</b>
<b>Agriculture - Crops</b>	<ul style="list-style-type: none"> <li>■ Crop inundation due to waterlogging/flooding</li> <li>■ Crop losses due to long dry spells/droughts</li> <li>■ Pests and disease incidence</li> <li>■ .....</li> <li>■ .....</li> </ul>	<ul style="list-style-type: none"> <li>■ Crops that can stand waterlogging or drought conditions</li> <li>■ Mechanisms to reduce pests attack</li> <li>■ .....</li> </ul>
<b>Livestock</b>	<ul style="list-style-type: none"> <li>■ Morbidity and Mortality</li> <li>■ Impact of fodder quality</li> <li>■ .....</li> <li>■ .....</li> </ul>	<ul style="list-style-type: none"> <li>■ Good quality fodder</li> <li>■ Reduce morbidity and mortality in animals</li> <li>■ .....</li> </ul>
<b>Horticulture</b>	<ul style="list-style-type: none"> <li>■ Crop inundation due to waterlogging/flooding</li> <li>■ Crop losses due to long dry spells/droughts</li> <li>■ Pests and disease incidence</li> <li>■ .....</li> <li>■ .....</li> </ul>	<ul style="list-style-type: none"> <li>■ Crops that can stand waterlogging or drought conditions</li> <li>■ Mechanisms to reduce pests attack</li> <li>■ .....</li> </ul>
<b>Skill based self-employment</b>	<ul style="list-style-type: none"> <li>■ Distressed migration</li> <li>■ .....</li> </ul>	<ul style="list-style-type: none"> <li>■ Reduce migration</li> <li>■ .....</li> </ul>

**Key Take-aways**

- Participants will be able to identify the needed actions related to Human Development and Social Security, Structures, Environment and Disaster Management and Income, employment and economic aspects.

**Debriefing questions**

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- How did the session and exercise support you in understanding climate change impacts and associated risks relevant to your work?

**Hint for the trainer**

- Adaptation needs should be fairly broad at this stage. Help participants to see the “big picture” at this point in the process so that they do not inadvertently skip some steps in adaptation planning.



## SModule 4. Climate change adaptation measures

<b>Learning objective</b>	To understand and select CCA actions based on risk analysis, identified challenges and needs
<b>Duration</b>	Shortest version: 40 min Complete version: 2 h 40 min

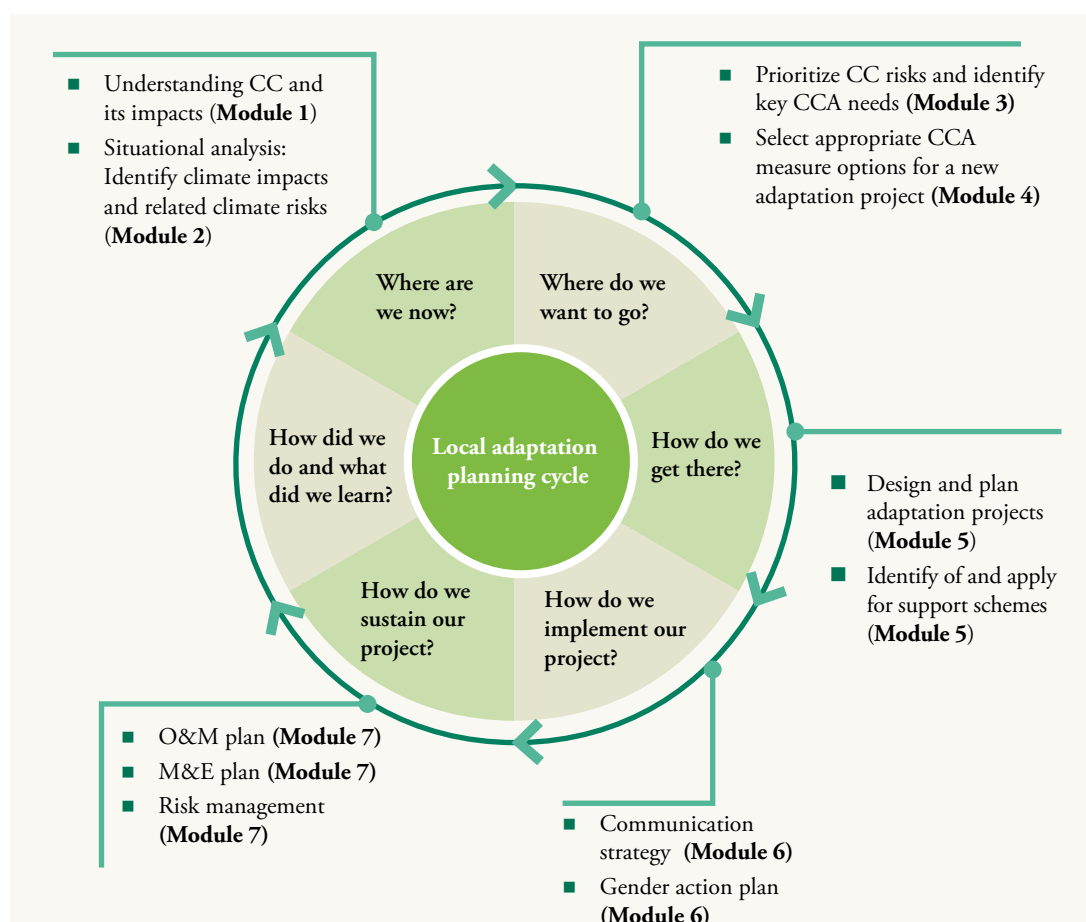
### Module planner

Duration	Sessions of module	Shortest version	Complete version
40 min	Session 4.1 Input sessions on best practices for climate adaptation	×	×
120 min	Session 4.2 Identifying, assessing and prioritizing adaptation measures	Step 2 (60 min)	×

### Integration of Module 4 along the local adaptation planning cycle

The methodology of the Capacity Building Package follows the logical processes of local adaptation planning. The figure below shows the arrangement of the modules of the CDP, their main steps and methods employed. The colour dark orange indicates that you are in Module 4 and Step 4 of the Local Adaptation Planning cycle, which provides PRI-members with an understanding of best practices of local adaptation projects and guides them to assess and select appropriate CCA measures based on their climate risks and adaptation needs identified in the previous modules. The results from Module 4 are the foundation and prerequisite for developing CCA projects.

In the ExcelTool you will find a tab of the same colour. Here you can document the results achieved by your group of participants in Module 4.



## Session 4.1 Input sessions on best practices for climate adaptation

<b>Learning objective</b>	To learn about adaptation measures and best practices	
<b>Prerequisites / prior knowledge for successful participation</b>	Prior knowledge on climate risk and vulnerability and PRA exercises	
<b>Steps (Duration)</b>	<b>Step 1.</b> Understanding the framework of vulnerability to resilience	10 min
	<b>Step 2.</b> Best practices for climate adaptation	30 min
<b>Total duration</b>	40 min	
<b>Methods/Exercises</b>	Input presentations	
<b>Material</b>	PowerPoint presentation 4.1, handout 4.1 chart paper, markers, Laptop, LCD projector	
<b>Preparation of the material</b>	You may update the given vulnerability sheet, data formats and case studies used in the session, should they no longer be up-to-date (status 2021).	

### Step-by-step approach

This session provides a general understanding of how vulnerable systems can be transformed into resilient systems (**Step 1**) supported by best practices examples for climate adaptation and resilience building in HP (**Step 2**). These include:

- Springs and Participatory Groundwater Management in Sirmour District of Himachal Pradesh
- Rainwater harvesting systems
- Interconnected water harvesting structures for managing climate risks for fruits
- Resilient seeds
- Organic farming for enhancing farm adaptation
- Farmer Field Schools – A participatory extension approach

### Step 1. Understanding the framework of vulnerability to resilience

The journey from vulnerability to resilience need to have series of steps for climate adaptive actions. Vulnerability of peoples' vulnerability of people is intrinsically linked to exposure to hazards and stresses; nature of fragile ecosystems of the Himalayan region and livelihoods; future uncertainty; and weak governance. It provides detailed explanations of the linkages between these factors, as well as ideas for action to strengthen resilience. Himachal Pradesh has conducted a comprehensive district level vulnerability analysis as part of the preparation of State Action Plan on Climate Change. It is the basic document guiding the adaptation panning process in the state. The participants are expected to familiarise the vulnerability of their districts while they prepare their GP level plans.

The **resilience construct** intends to enhance the capacity of a system to bounce back from the climate stress and shock due to disaster.



Figure 13. Himachal Pradesh current and projected vulnerability

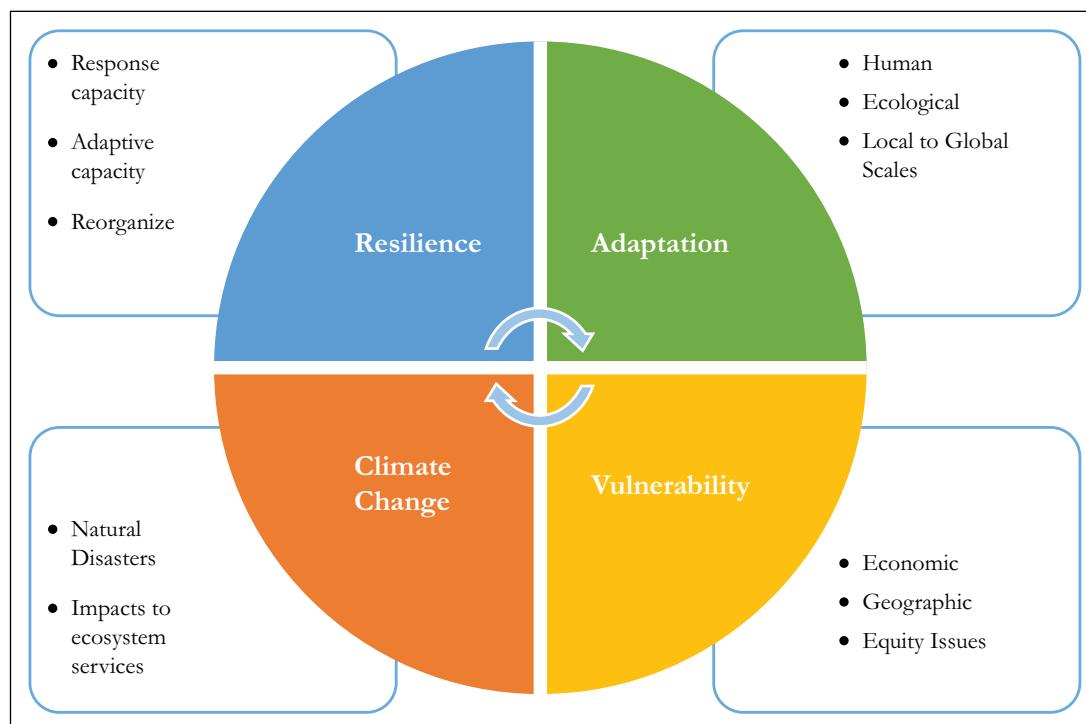
Himachal Pradesh Current and Projected Vulnerability																		
Districts	Composite Vulnerability Index (CVI)					Water Resources VI (WRVI)					Health/Extreme Climate VI (CLVI)							
	BL Rank	RCP4.5			RCP8.5		BL Rank	RCP4.5			RCP8.5		BL Rank	RCP4.5			RCP8.5	
		BL	MC	EC	MC	EC		BL	MC	EC	MC	EC		BL	BL	MC	EC	MC
Lahul & Spiti	1	VL	VL	VL	VL	VL	1	VL	VL	VL	VL	VL	1	VL	VL	VL	VL	VL
Kinnaur	2	L	L	L	L	L	10	VH	VH	VH	VH	VH	3	VL	VL	VL	VL	VL
Solan	3	L	L	L	L	L	9	VH	VH	VH	H	H	8	H	H	H	H	VH
Kullu	4	L	L	L	L	M	4	M	H	H	H	VH	2	VL	VL	VL	VL	L
Shimla	5	L	L	L	L	L	8	H	H	H	H	H	4	L	L	L	L	M
Hamirpur	6	M	M	M	M	M	2	L	L	L	L	L	11	H	VH	VH	VH	VH
Mandi	6	M	M	M	M	M	11	VH	VH	VH	VH	H	6	L	M	M	M	H
Kangra	8	M	M	M	M	H	5	H	H	H	H	H	7	M	H	H	H	H
Una	9	M	M	M	M	M	3	L	M	L	L	L	12	VH	VH	VH	VH	VH
Bilaspur	10	H	H	H	H	H	12	VH	VH	VH	VH	VH	9	H	H	H	H	VH
Sirmaur	11	H	H	H	H	H	6	H	H	H	H	H	10	H	H	VH	VH	VH
Chamba	12	VH	VH	VH	VH	VH	7	H	VH	VH	H	VH	5	L	M	M	M	M

BL: situation now baseline, L:Low, M: Medium, H: High, H: High, VH: Very High

Source: GIZ

The **resilience construct** intends to enhance the capacity of a system to bounce back from the climate stress and shock due to disaster.

Figure 14. Interdependence between resilience, adaptation, vulnerability and climate change



### Climate resilient infrastructure

As per OECD, climate-resilient infrastructure is such that it is planned, designed, built and operated in a way that it anticipates, prepares for, and adapts to changing climate conditions. It can also withstand, respond to, and recover rapidly from disruptions caused disasters arising due to change in climate. It may not fully eliminate the risks due to climate change and disaster but has the ability to reduce the effect.



Source: OECD

These infrastructures should be (a) durable (b) equitable (c) flexible for convergence.

## Step 2. Best adaptation practices for climate adaptation in the water, agriculture and DRR sectors

### Climate Resilient Agriculture

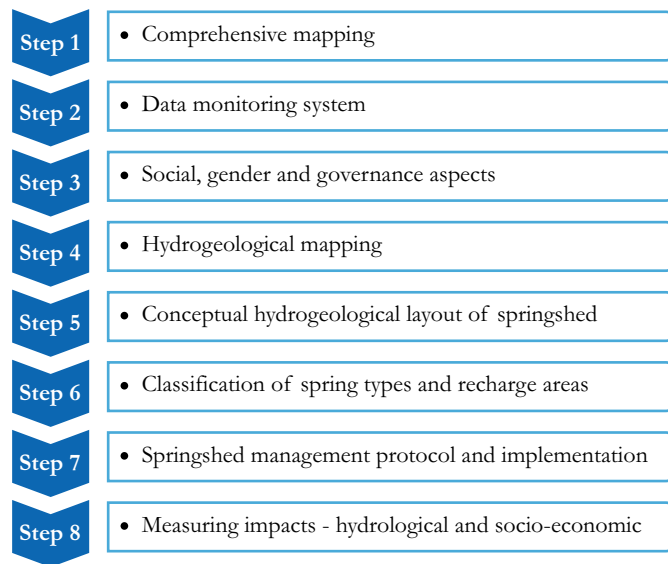
Agriculture is highly sensitive to climate change. It suffers from the change in climate variables such as change in temperature and change in precipitation pattern. It also gets severely affected due to hazard/disaster events fast onsetting flash floods and slow onsetting droughts. Studies show, due to climate change can reduce agriculture income by 10-15% on an average and sometimes leading to total loss during disasters.

Climate-resilient agriculture (CRA) is an approach that includes sustainable use of existing natural resources through crop and livestock production systems and as far as possible using modern farm advisory and indigenous methods to achieve long-term higher productivity and farm incomes under climate variabilities. It includes:

- Water and nutrient management;
- Efficient use and management of water at farm and landscape level
- Weather and climate related advisory for cropping system change and crop management,
- Tolerant seeds and breeds,
- Conservation agriculture

### Springs and Participatory Groundwater Management in Sirmour District of Himachal Pradesh

People’s Science Institute from Dehradun has used the concept of Participatory Groundwater Management (PGWM) to manage spring water in the Thanakasoga – Luhali Panchayat area through a comprehensive spring shed management approach. They have used local community to identify various technical parameters of the spring shed using simple participative techniques using local materials. The most significant impact has been improved spring discharge, especially during the lean season, through systematic recharge measures based on hydrogeological mapping. Protection and conservation of the natural recharge area for the aquifers feeding this spring system has also led to improved quality of spring water over a three-year period. Demand management protocols have also been developed in close co-ordination with the local communities. The eight-step approach for spring shed management protocol has been duly followed.



Source: Niti Aayog

### Rainwater harvesting systems

Rainwater harvesting is a simple strategy by which rainfall is gathered and stored for future usage. The process involves collection and storage of rainwater with help of artificially designed systems, that runs off natural or man-made catchment areas e.g. rooftop, compounds, rocky surface, hill slopes or artificially repaired impervious/semi-pervious land surface. The collected rainwater from surfaces on which rain falls may be filtered, stored and utilized in different ways or directly used for recharge purposes. With depleting groundwater levels and fluctuating climate conditions, this measure can go a long way to help mitigate the adverse effects rising water scarcity. Reserving rainwater can help recharge local aquifers, reduce urban flooding and most notably, ensure water availability in water-scarce zones.

Figure 15. Rainwater harvesting pond



Source: [www.facebook.com/manjunath.reddy](http://www.facebook.com/manjunath.reddy)

#### Advantages of implementing rain-water harvesting:

- **Reduced Water Bills**

Rainwater harvesting systems are cost-effective, provide high-quality water, lessens dependence on wells and are considerably easy to maintain since they are not utilized for drinking, cooking or other sensitive uses.

- **Ecological benefit:**

The ecological benefits of rainwater harvesting are immense. It minimizes the impacts of flooding (both rural and urban) by funneling the off water into large tanks for recycling and helps reduce the load placed upon drainage systems.

- **An adequate means for Irrigation purpose**

Harvesting rainwater allows the collection of large amounts of water and mitigates the effects of drought.

- **Reduces demand on groundwater**

Rainwater harvesting (RWH) has been proved to be a sustainable option in solving the on-ground water shortage reducing the demand on groundwater and thus foster groundwater level recovery (surface runoff harvesting). The harvested rainwater could be used to further help their recharge (groundwater recharge).

## Two major techniques of rainwater harvesting:

### 1. Surface runoff harvesting

In this method, rainwater flows away as surface runoff and can be stored for future use. Surface water can be stored by diverting the flow of small creeks and streams into reservoirs on the surface or underground. It can provide water for farming, for cattle and also for general domestic use. Surface runoff harvesting is most suitable in urban areas.

### 2. Rooftop Rainwater Harvesting

In this process the roof of a house acts as a catchment and rainwater is collected there. This collected water can be stored in a tank or can be diverted to a recharge pit. This is very economical for garden irrigation and can be used for drinking purposes after proper filtration.

Rainwater in rural areas can be harvested through	Rainwater/storm runoff can be harvested in urban areas through
<ul style="list-style-type: none"> <li>■ Gully Plug</li> <li>■ Contour Bund</li> <li>■ Dugwell Recharge</li> <li>■ Percolation Tank</li> <li>■ Check Dam/Cement Plug/Nala Bund</li> <li>■ Recharge Shaft</li> </ul>	<ul style="list-style-type: none"> <li>■ Recharge Pit</li> <li>■ Recharge Trench</li> <li>■ Tubewell</li> <li>■ Recharge Well</li> </ul>

The surplus rainwater can be used to e.g. recharge groundwater aquifer through artificial recharge techniques. Groundwater recharge is a hydrologic process where water moves downward from surface water to groundwater. Recharge is the primary method through which water enters an aquifer. The aquifer also serves as a distribution system.

Although rainwater harvesting measure is deemed to be a desirable concept since the last few years, it is rarely being implemented in rural India. Different regions of the country practiced a variety of rainwater harvesting and artificial recharge methods. Some ancient rainwater harvesting methods followed in India which includes Madakas, Ahar Pynes, Surangas, Taankas, etc.

## Resilient Cropping system

The following **case study** is a brilliant example of using modern technology as well as traditional techniques to address climate change risks. Nekram took over his family's farmlands in the mid-nineties, the soil and land fertility were in doldrums because of rampant use of chemical fertilisers. He gradually reduced fertiliser use and shifted to vermicompost and FYM. He also brought back millet cultivation. He travelled to various districts to acquire knowledge on ancient farming techniques from elderly farmers, some older than 100 years. A majority of them shared an indigenous practice called Nau-Anaj (nau is 9 and anaj is crop). It is an intercropping or mixed farming method to grow nine foodgrains on the same piece of land. These crops are a combination of lentils, cereals, vegetables, legumes and creepers. It was a simple idea, it ensured to have backup harvested crops in case one of them fails due to

**Figure 16.** Success story of a resilient crop system



Source: *the better India, myGov.in*

climatic conditions or pest attacks. This ensures that even if the farmer cannot sell the crops for some reason, Similar systems are in operation in southern India and eastern India and in tribal belts. The system is still resilient and reduces risks both climate as well as during disasters.

### **Interconnected water harvesting structures for managing climate risks for fruits**

Kullu district is an important apple growing areas of the state of HP. The annual apple production usually lies between 80,000 to 90,000 metric tons. This represents about 9,000 truckloads of apples every year. Apart from that, many other fruit crops are grown in this district. Due to climate change temperature is increasing the apple cultivation is shifting from lower part of the valley to upper reaches to meet the chilling requirements. Climate variability in terms of historical rainfall trend over last three decades indicated that dry spells of 10-20 days are increasing particularly during kharif season. To mitigate this aspect major thrust has been on soil and water conservation. For this the following measures have been taken that has proven to be resilient.

<b>Fruit</b>	<b>Area (ha)</b>	<b>Season</b>
Apple (Standard)	18524	Jul-Oct
Apple (Spur)	767	Jul-Oct
Plum	893	Jun
Pears	400	Jul-Aug
Apricot	190	Jun-Jul
Kiwi	25	Jul
Almonds	368	Jul-Aug

A series of inter-linked water storage tanks (one tank of 50 m<sup>3</sup> capacity and three tanks of 20 m<sup>3</sup> each) were constructed. Large storage structures are not feasible in a fragile hill ecosystem. Farmers were motivated through the awareness cum training programme by KVKs to construct additional water harvesting structures and 4 more water storage tanks of 80 m<sup>3</sup> capacity were added. Schemes like MNREGA and NMSA were leveraged for this. These tanks were able to provide irrigation to transplanted tomatoes, cauliflower and cabbage during summer and newly planted pomegranate plants which replaced some areas vacated by apple and also replacing some cereals at risk. This significantly helped in changing the cropping system and enhanced income that was dwindling due to reduction in apple cultivation. [Source: NICRA]

### **Resilient seeds**

Resilient seed systems are central to sustainable food systems that are renewable, climate resilient, equitable, diverse, healthy, and interconnected. In the light of critical global challenges such as climate change and food and nutrition security, use of drought and flood tolerant seed varieties are increasingly being preferred and adopted by farmers. For instance, the International Rice Research Institute (IRRI) has successfully developed improved, stress-tolerant paddy seed varieties for cultivation in eastern India that are tolerant to drought (Sahbhagi dhan) and submergence (Swarna-Sub1). Adoption of these varieties by farmers have proven to give potential benefits in the wake of changing climate.

Here we provide a chart of various resilient varieties recommended for HP based on the agroclimatic conditions and vulnerability and the resultant adaption benefit.



Figure 17. Climate resilient seeds

STRATEGY 1		Using short duration, pest resistance, heat tolerant cultivars increasing crop varieties suitable for Early Season, Mid-Season, Late season drought		
Crop	Variety	Year of Release	Cultivation Conditions	Climate-relevant features
Wheat	DBW173	2018	Irrigated Late sown (December)	<ul style="list-style-type: none"> <li>High yielding variety (&gt;45 q/ha, average yield)</li> <li>Tolerant to terminal heat stress hence, suitable for late sown conditions</li> <li>Resistant to yellow rust (most of the prevalent races) and karnal bunt</li> <li>High protein content (~12.5%)</li> <li>Good nutritional quality</li> <li>Excellent chapati-making features</li> </ul>
Wheat	Raj 3777		Suitable for late sown and rain-fed, irrigated conditions	<ul style="list-style-type: none"> <li>Resistant to karnal bunt.</li> <li>Average yield of 41-45 qts/ha</li> <li>Medium term (131-143 days to mature).</li> <li>Very good for bread making; protein content 12-13%</li> </ul>
Wheat	HS 295		Suitable for timely sown and restricted irrigation, rain-fed conditions	<ul style="list-style-type: none"> <li>Average yield of 21-25 qts/ha</li> <li>Early maturity (126-134 days to mature)</li> <li>Protein content 12-13%</li> </ul>
Wheat	PBW 343		Suitable for timely sown and irrigated conditions	<ul style="list-style-type: none"> <li>Resistant to stripe rust (yellow rust), leaf rust (brown rust), karnal bunt</li> <li>Early maturity (126-134 days to mature)</li> </ul>
Wheat	PBW 502		Timely sown and irrigated conditions	<ul style="list-style-type: none"> <li>Early maturity (126-134 days to mature)</li> <li>Resistant to karnal bunt (care should be taken to save it from loose smut)</li> <li>Protein content is 12-13%</li> </ul>
Wheat	HPW236		Suitable for late sown and rain-fed, irrigated conditions	<ul style="list-style-type: none"> <li>Drought stress</li> <li>Resistant to yellow rust and other diseases</li> </ul>
Rice	VL Dhan 221		Timely sown under rain-fed condition	<ul style="list-style-type: none"> <li>Suitable under drought stress in rain-fed areas</li> </ul>
Toria	Bhawani			<ul style="list-style-type: none"> <li>Suitable under drought stress</li> </ul>
Rice	ARIZE 6129, PAC807		Cultivation under delayed monsoon	<ul style="list-style-type: none"> <li>Suitable under drought stress in rain-fed areas</li> </ul>
Maize	Bajaura Makka		Cultivation under delayed monsoon	<ul style="list-style-type: none"> <li>Suitable under drought stress in rain-fed areas</li> </ul>

Source: DEST, GoHP (2017) SLADRC Project Training Manual, Module 1 by CTRAN

### Organic farming for enhancing farm adaptation

The adoption of diversified adaptive approaches by farmer tends to alleviate their risk towards adverse impacts of Climate Change. The usage of chemical fertilizer in farms are reducing the soil fertility, reducing farm yield, increasing the soil erosion and causing water pollution. Organic farming done by using organic manure is a solution to problems caused by inorganic farming.

**Benefits of Organic manure-** Organic manure reduces the soil erosion and enhances its fertility. It not only increases the carbon content in the soil but also reduces the industrial greenhouse gas emissions **by restricting the usage of chemical fertilisers-prepared by burning fossil fuels. At the same time, it enhances the porosity and soil moisture retention in the soil reducing the demand of frequent irrigation.** Organic manure replaces the nitrogen rich chemical fertilizer leading to reduction in air pollution and water pollution. **A few of the methods for preparation of organic manure has been mentioned below:**

**Vermicompost-** It is a biotechnological process of composting, in which earthworms are used to convert the biodegradable waste into a better fertilizer product. Procedure for preparing vermicompost is- prepare a plastic or concrete tank depending upon the availability of raw material. Collect the biomass, place it under sun for 8-10 days and chop it. Then, sprinkle the cow dung slurry on chopped biomass for quick decomposition. Add a layer (2 – 3 inch) of soil at the bottom of the tank. Now prepare fine bedding in tank up to 0.5-1 ft by distributing the decomposed cow dung, dried leaves and other biodegradable wastes on the layer of soil. After

Figure 18. Vermicompost



Source: GEAG

adding bio-wastes, release the earthworm & cover it. Sprinkle water regularly within 1-2 days to maintain the moisture in the pit. Cover the tank for 24 days and finally, compost is ready [1].

**Compost Pit-** This is a simple way of producing organic manure by digging a deep hole into the ground, for decomposition of collected biodegradable waste (kitchen waste, agricultural waste, fruit waste, plants & animal residue, wood etc.) into organic manure. This method involves digging a deep hole of size (length\*breath\*depth) as 10\*4\*3 feet into the ground, followed by adding biodegradable wastes into the pit till the piling of waste reaches the level of ground. Finally, cover the pit with 30-40 cm thick layer of animal refuse and then leave it for 6-8 months for the preparation of manure.

**Figure 19.** Compost pit



Source: GEAG

**Nadep Compost-** It is the process of converting vegetable, other biodegradable substances and animal refuses to manure. NADEP method of composting is aerobic decomposition of organic matter. The procedure for making nadep compost is construct an aerated brick tank of size as 10 ft (length) x 5 ft (breadth) x 3 ft (height). Then, fill the tank with biodegradable waste followed by mixing of waste with cattle dung & water followed by adding layer of dry soil. The approximate ratio of mixing of green waste to cattle dung to water to dry soil in a single layer will be 10:1:10:10. Repeat this layer formation till the compost is filled and then cover it for next 3 months for making final manure. The intermediary moistening of compost at an interval of 6-15 must be regularly carried out for complete 3 months [2].

**Figure 20.** Nadep compost



Source: GEAG

**Figure 21.** Organic farming



Source: Organic Farming-sustainable hill agriculture, Directorate of Agriculture, HP

In HP, under RKVY scheme thrust was given on organic farming and certification of organic products. The farmers were given demonstration on the methods of preparing different kinds of on farm inputs and their uses viz. Composting, FYM, Vermi compost, Matka Khad, Jeevamrit, Bijamrit & Vermin. The literature in Hindi language was also distributed among the farmers. The KVKs under the university network of the state trained the farmers on management of soil fertility based on soil health card analysis, biocontrol of disease and pests and post-harvest management. They were incentivized if they avoided chemical fertiliser and pesticides. The farmers have been linked to organized e-retailers. One of the organic grower group Salogra (SOGG) have also been linked with Big-basket New Delhi, Noble Hear Amritsar Punjab, Regal kitchen fresh Baddi HP and Hasora Organic at Gurgaon [3].

1. AGR 304: NADEP Method. (n.d.). E-course Online. Retrieved May 14, 2021, from <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=108180>
2. How to prepare vermicompost. (n.d.). BYJU. Retrieved February 15, 2021, from <https://byjus.com/biology/vermicomposting/>
3. Organic Farming-sustainable hill agriculture, Directorate of Agriculture, HP

## Best Practices on Resilient Extension

### Farmer Field Schools – A participatory extension approach

Farmer Field Schools (FFS) is a unique way to educate farmers and is an effective platform for sharing of experiences and collectively solving agriculture related problems, more so in the wake of changing climate and its adverse impacts on agriculture. The first FFS were designed and managed by the UN Food and Agriculture Organization in Indonesia in 1989. Since then more than two million farmers across Asia have participated in this type of learning. During the 1970s it became increasingly apparent that pest resistance and resurgence caused by the indiscriminate use of insecticides posed an immediate threat to the gains of the Green Revolution. At the same time, new researches demonstrated the viability of biological control of major rice pests.

However, gaps still existed between the scientific knowledge generated in research institutions and common farmer practices, conditioned by years of aggressive promotion of pesticide use. Over the ensuing years, a number of approaches were tried to bring integrated pest management (IPM) to small marginal farmers. By the end of the 1980s, a new approach to farmer training emerged in Indonesia called the ‘Farmer Field School’ (FFS). These field schools were designed basically to address the problem of lack of knowledge among farmers relating to agro ecology, particularly the relationship between insect pests and beneficial insects.

The Farmer Field School brings together concepts and methods from agro ecology, experiential education and community development. These FFS were initiated based on two premises. Firstly, although farming itself is done mainly on individual farms, the rural community plays an essential role in farmer’s strategies for survival and development. Farmers like to get together to share information and other forms of mutual support with others whom they trust. Secondly, farmers have a tradition of developing and applying technologies and refining it through experiences. They learn tacitly – learning by doing.

The FFS approach is built around these two premises. It responds directly to the information needs of the small marginal woman farmers who have been largely neglected in conventional extension systems. The FFS offers farmers the opportunity to learn by sharing, by being involved in experimentation, discussion and decision-making. This strengthens the sense of ownership of rural communities in technological packages and evolving new knowledge and skills.

#### Farmer field school Apple by Gram Disha Trust

There are issues, specifically with older apple orchards with an average lifespan of over 3-5 decades. These orchards usually have reduced yield. With management costs of conventional apple orchards increasing yearly number of growers are opting for conversion of old orchards. In the recent decade or so, a wider debate has emerged especially in Himachal Pradesh, on the efficacy of High-Density Apple Cultivation system based on clonal rootstocks versus Seedling variety of trees based on the older method of propagation. There are clear proponents and opponents to both the systems with multivariate dependencies to be addressed from a grower’s point of view. Issues of initial investment, irrigation sources, soil fertility needs, resilient varieties, reduced pest incidence and overall orchard management costs. This also includes the discussion on the choice of trees and root stocks based on selection method versus those of tissue culture. This is exacerbated by proper knowledge dissemination on suitable choice of Root stock based on climatic and soil conditions (including altitude) i.e. M9 vs M111 vs M126 etc and the choice of compatible scion or bud wood for varieties like Red Kan, Velox, Gala, Granny Smith, etc.



Towards attempting to find solutions to these contemporary issues – the farmer members of Gram Disha Jaivik SHG at village Pangna along with Gram Disha Trust and Kalasan Nursery Farm are developing a model field plot with the following elements of observation for smallholder farmers intending to grow without agrochemicals –

- Develop a suitable plot where both systems – High-Density Rootstock and Contemporary Seedling based systems can be observed simultaneously in similar soil and management conditions.
- Complete non-use of agrochemicals and experimentation with suitable techniques of agroecology – by using in-situ and ex-situ inputs – for both soil health, plant nutrition and pest control.
- Use of in-situ biomass (to all extent possible) recycling of crop and animal residue to enhance soil health

### Useful literature and databases

- The details on farmer field schools are available at: <https://gramdisha.wordpress.com/blog-2/workshops-2/january-2019-field-school-about-apple-cultivation-techniques/>
- Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP. Available at: [https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf)
- Allen et al. (2016): Glacial lake outburst flood risk in Himachal Pradesh, India: an integrative and anticipatory approach considering current and future threats. [https://www.researchgate.net/publication/306009887\\_Glacial\\_lake\\_outburst\\_flood\\_risk\\_in\\_Himachal\\_Pradesh\\_India\\_an\\_integrative\\_and\\_anticipatory\\_approach\\_considering\\_current\\_and\\_future\\_threats](https://www.researchgate.net/publication/306009887_Glacial_lake_outburst_flood_risk_in_Himachal_Pradesh_India_an_integrative_and_anticipatory_approach_considering_current_and_future_threats)
- Department of Drinking Water and Sanitation, Ministry Of Jal Shakti: Jal Jeevan Mission Presentations. Available at: <https://jalshakti-ddws.gov.in/presentations-water>
- UNFCCC: Adaptation knowledge portal. Available at: <https://www4.unfccc.int/sites/mwpstaging/Pages/Home.aspx>
- European Climate Adaptation Platform Climate-ADAPT: Adaptation options. Available at: <https://climate-adapt.eea.europa.eu/knowledge/adaptation-information/adaptation-measures>
- Adaptation Technology Database by Asia Pacific Adaptation Network (APAN): Adaptation technologies database. Available at: [http://www.asiapacificadapt.net/adaptation\\_technolog/](http://www.asiapacificadapt.net/adaptation_technolog/)
- UNEP DTU Partnership: Technology Needs Assessment Database. Available at: <https://tech-action.unepdtu.org/tna-database/>

### Key take-aways

- The best practices described are indicative, more such practices can be found through discussion and interviews with lead farmers and institutions.

### Debriefing questions

- What are your important take-away messages from this session?
- What best practices presented do you find most relevant for your work?

## Session 4.2 Identifying, assessing and prioritising adaptation measures

<b>Learning objective</b>	To identify, assess and prioritise adaptation measures to selected CCA needs.	
<b>Prerequisites / prior knowledge for successful participation</b>	CCA needs are identified	
<b>Steps (duration)</b>	Step 1. Understanding and identifying CCA measure options	30 min
	Step 2. Assessing adaptation options according to different criteria	60 min
	Step 3. Selecting CCA measure(s) to be implemented	30 min
<b>Total duration</b>	2 h	
<b>Methods/Exercises</b>	Input presentation, identify suitable adaptation options using databases and a CCA matrix, scoring of the options according to different criteria	
<b>Material</b>	PowerPoint presentation 4.2, Handout 4.2, Laptop, LCD projector, desirable: internet access	
<b>Preparation of the material</b>	You may adapt the examples provided to facilitate the exercises in this session to the participants' context.	

### Step-by-step approach

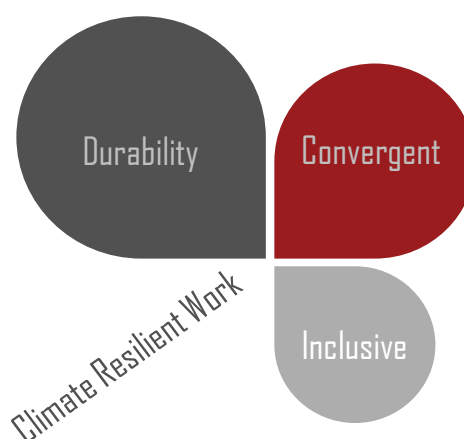
- This module provides inspiration and tools for identifying, assessing and prioritising suitable CCA measures for adapting to the most pressing climate risks that were identified in Module 2 and prioritized in Module 3.
- In **Step 1**, participants will identify suitable CCA measure options to address their prioritised CC risks and CCA needs. Knowledge material will introduce the participants to different categories of adaptation measures and will provide inspiration including local case studies. Participants are also invited to share known measures from their working environment.
- In **Step 2**, participants assess the measure options identified under considering different criteria including level of risk reduction, technical feasibility, internal feasibility, costs and benefits, social and environmental impacts and acceptance of and support for the measure.
- Finally, in **Step 3**, the identified measure options are compared and ranked according to the scores that they received in Step 2 for the different criteria. The best ranked measure options will be selected for implementation.

### Step 1. Understanding and identifying adaptation options

#### Input presentation

- Present slides 3-7 to the participants to provide them with some general background information on adaptation/climate resilient measures

To achieve climate resilience new assets should be prioritized, planned, designed, built and operated to account for the climate changes that may occur over their lifetimes. Existing infrastructure may need to be retrofitted, or managed differently, given climate change. Lastly, additional infrastructure, need to be constructed to address the physical impacts of climate change. This additional infrastructure can include traditional infrastructure, such as hard defenses and other engineered solutions, as well as skill and capacities to operate and maintain such infrastructures.



**Key elements of climate resilient work are:**

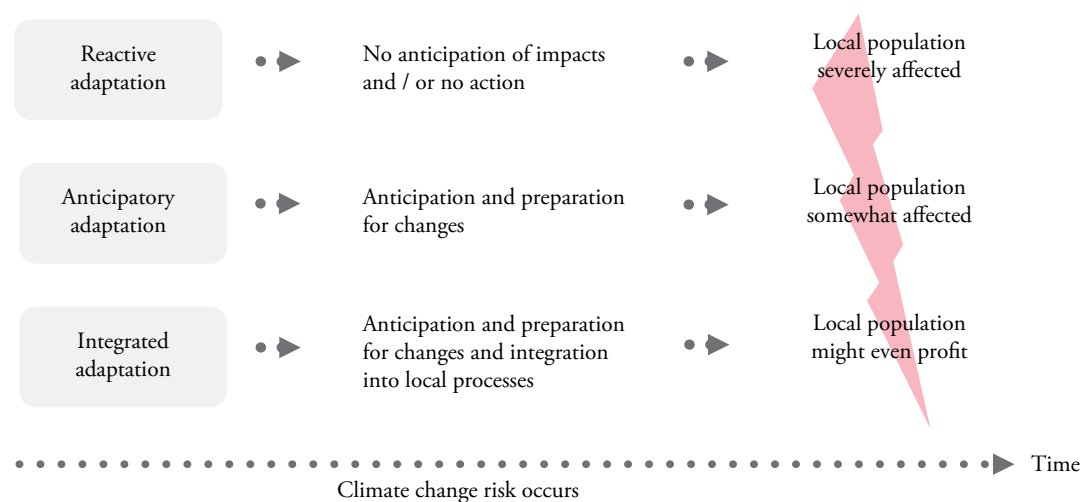
**Durability:** They should have the ability to endure climate change related stress during their lifetime. There should be tweaking of its design/retrofitting to achieve that. (e.g. LBCD structure can be tweaked considering the future rainfall intensity)

**Convergent:** A climate resilient outcome can only be achieved through participation of many sectoral departments/agencies and stakeholders. Therefore, the planning for such works should have desired flexibility and complementarity for resource and technology leverage (e.g. a farm pond in a cascade should take into the crop

**Inclusive:** The infrastructure must provide equal opportunity to reduce climate stress for men and women and other disadvantaged social groups.

**Timing and integration of adaptation options (slide 4)**

**Figure 22.** Timing and integration of adaptation options



(Source: adelphi)

	Reactive adaptation	Anticipatory/proactive adaptation	Integrated adaptation
<b>Definition</b>	Adaption that takes place <b>AFTER</b> impacts of climate change have been observed (IPCC TAR, 2001)	Adaption that takes place <b>BEFORE</b> impacts of climate change are observed (IPCC TAR, 2001)	Adaption that takes place <b>BEFORE</b> impacts of climate change are observed and has been <b>INTEGRATED</b> into local planning processes allowing the community to effectively manage risks, make use of synergies between measures, seize benefits and use opportunities from adaptation.
<b>Example</b>	e.g. dikes were strengthened after the village was flooded several times.	e.g. preventive installation of rainwater harvesting systems as a proactive response to the forecast of decreasing rainfall for the coming year.	E.g. climate change indicators are included in existing monitoring concepts, irrigation schedules and/or crop harvesting schedules.
<b>Effect</b>	Local population <b>severly</b> affected	Local population <b>somewhat</b> affected	Local population <b>not</b> affected or might even profit

Depending on the timing and integration of adaptation measures, the impacts of climate change at the local level (village, farm, etc.) can be very different. Both anticipatory and integrated adaptation enable proactive adaptation before damage occurs.

**Reactive adaptation:** takes place after impacts of climate change have been observed (IPCC TAR, 2001) e.g. dikes were strengthened after the village was flooded several times.

**Anticipatory/proactive adaptation:** takes place before impacts of climate change are observed (IPCC TAR, 2001) e.g. preventive installation of rainwater harvesting systems as a proactive response to the forecast of decreasing rainfall for the coming year.

**Integrated adaptation:** takes place before impacts of climate change are observed and that has been integrated into local planning processes allowing the community to effectively manage risks, make use of synergies between measures, seize benefits and use opportunities from adaptation. E.g. climate change indicators are included in existing monitoring concepts, irrigation schedules and/or crop harvesting schedules.

### How to categorize adaptation measures? (slide 6-8)

#### Grey: Technical measures

- Examples: infiltration ponds for managed aquifer recharge, rainwater harvesting systems, solar-powered irrigation systems, etc.
- Immediate risk reduction, medium- and long-term pay-offs

#### Green: Measures that are based on ecosystems and their services

- Examples: renaturation of flood zones, biodiverse agro-forestry systems, use of adapted crops and varieties, etc.
- Green measures are often cheaper and more flexible than technical solutions
- Often provide additional co-benefits (e.g. water savings, energy savings, air quality improvement, carbon sequestration)

#### Soft: Managerial, knowledge- and capacity-based solutions

- Examples: trainings, formation of water user groups, climate risk insurance, etc.
- Often accompany grey or green measures as these may rely on particular internal/organisational capacity and ability, that are aimed at enhancing by the soft measures

- Select relevant case studies of best practices for your participants. If the examples given in the presentation slides are not relevant to your group of participants, replace these by other examples. Make sure to name a number of examples to make participants get an idea of the variety of adaptation measures.
- Discuss with the group what examples of adaptation measures they know.

### Group work: Identify adaptation options for prioritized risks and needs (slide 8)

- Identify adaptation measures with the participants for addressing the prioritised risks and needs, using worksheet 1 of handout 4.2.
- Ask the participants to take a few minutes, two close their eyes and to freely brainstorm potential measures to the climate risks and key adaptation needs their face in their area (e.g. drought/flood)
- For inspiration led the participants use existing databases on CCA measures and/or the CCA measure matrix provided with the handout 4.2 (you will find examples with brief descriptions in the table below).



**Potential case study:** Your village is chronically drought prone. You have to use the MGNREGA money to benefit your village. You know in next 20 years most of your existing springs will dry and your orchards and fields will not give you enough income. You have to brainstorm in the Gram Sabha various options and identify a few that can be taken up on a priority basis in next 1-3 years.

**Hints:**

- In general, it is advisable to have a good mix of solutions from all three categories (grey, green and soft) as they each have different advantages and disadvantages and complement each other.
- Look for measures that address multiple risks at the same time
- Encourage participants to be inspired by best practices from neighbouring villages that are well known and may address similar risks

**Databases for adaptation measures**

- **CCA measure matrix:** The CCA action matrix assigns appropriate adaptation measures to over 45 climate change risks, including from improved agricultural practices, water resource management, flood protection, infrastructure improvements, improved energy supply, ecosystem protection, etc. See handout 4.2 Annex

ID	Potential adaptation measures	Population affected																		
		IA1	IA2	IA	IA3	IA4	IA5	IA6	IA7	IA8	IA9	IA10	IA11	IA12	IA13	IA14	IA15	IA16	IA17	IA18
<b>Livelihood MA Improve fishing livelihood</b>																				
MA1	Fish processing technology units	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1
MA2	Drying systems for fish	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0
MA21	Solar drying system for fish	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0
MA3	Fish storage facilities	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0
MA31	Cold storage for fish (supported with solar energy)	0	0	0	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0
MA3	Community fish storage room	0	0	0	1	0	1	1	0	1	1	1	1	0	1	0	0	0	0	1
MA4	Storage facilities for nets and motors	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	1	0	0	0
MA6	Fishing technologies for sustainable fishing	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	1
<b>Livelihood MB Improve agriculture (crops and practices)</b>																				
MB1	Soil & moisture conservation measures	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	1			1
MB2	Soil fertilization	0	0	0	0	1	0	1	1	1	1	1	0	0	1	1	0	0	1	0
MB21	Utilization of bio-fertilizers/vermi compost and pesticides	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	0	0
MB2	Applying tank silt for soil fertilization	0	0	0	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0
MB2	Black soil application	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0
MB4	Improve irrigation technique or infrastructure / channels	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	0	1	0	1
MB4	Promote sprinkler irrigation system / efficient / micro water systems	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	0	1	0	1
MB4	Promotion of micro irrigation/water efficient use technologies by using solar	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	0	1	0
MB4	Strengthening of water irrigation channels	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	0	1	0	1
MB4	System of rice intensification (SRI)	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	1
MB4	drip irrigation	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	0	1	0	1
MB5	Promote drought/till/disease/pest resistant crops and practices	1	0	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0

- **European Climate Adaptation Platform Climate-ADAPT:** Climate-ADAPT aims to

support in adapting to climate change helping users to access and share data and information on adaptation case studies and potential adaptation options. The platform includes a database that contains quality checked information on success and limiting factors, cost and benefits, legal aspects, needed stakeholder involvement, implementation time and life time of each measure.

- Access database here: <https://climate-adapt.eea.europa.eu/knowledge/adaptation-information/adaptation-measures>

- **Adaptation Technology Database by Asia Pacific Adaptation Network (APAN):** APAN is a regional programme for managing and applying adaptation knowledge in the region, and supports governments and other organisations working on adaptation, with special emphases on the management of knowledge and capacity building. It provides an adaptation technology database comprising over 140 measures. For each measure information on the adaptation effect, needs addressed, costs, maintenance, technology performance etc. are provided.

- Access database here: [http://www.asiapacificadapt.net/adaptation\\_technolog/](http://www.asiapacificadapt.net/adaptation_technolog/)

- Collect and cluster with the participants identified measures by using the table below (see worksheet 2 of handout 4.2).

**Table 6.** Identified adaptation measure options

Risk	Need	Adaptation measure options
Scarcity of irrigation water due to droughts	Need for water efficient irrigation system	Drip irrigation system, Sprinkler irrigation system, etc.
.....	.....	.....

## Step 2. Assessing adaptation options according to different criteria

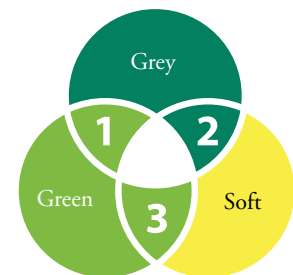
### Participatory exercise

#### Qualitative assessment of adaptation measures (slide 10)

A measure analysis helps identify and prioritise

Assess measures considering their...

- Level of risk reduction
- Technical feasibility
- Internal feasibility (skills)
- Costs and Benefits
- Social and environmental impacts (gender aspects; emission of GHGs)
- Acceptance and support (funding e.g. with government scheme)





- Present the different criteria under which a measure can be assessed. Further descriptions of the different recommended criteria can be found below. The list of criteria can be shortened or extended according to the needs of the participants.
- Assess each identified measure option based on each criterion with the participants and award scores from 1-5 by using worksheets 2-7 of handout 4.2. In step 3, the scores are summed to a final score, by which the adaptation measures will be ranked and prioritised (worksheet 8.1 & 8.2).
- During assessment it is advisable to let the participants note down critical assumptions taken. These will help later when evaluating the measures during implementation or operation.



## Criteria 1 - Assess level of risk reduction (slide 12)

Step 2. Assess adaptation options

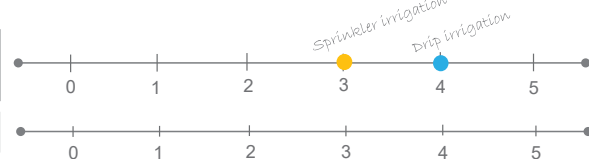
10 min, worksheet 2

### Criteria 1. Assess level of risk reduction

- Analyse and discuss in group work how effectively the identified measure options reduce risks  
**Example:** Drip irrigation has been shown to be more efficient in water use than sprinkler irrigation due to reduced evaporation and water runoff with additional benefits in plant disease control.
- 💡 Have in mind, combined measures are usually more effective than single measures.
- Insert your results in worksheet 2 and note down critical assumptions taken for the assessment. These will help later when evaluating the measures during implementation or operation.

**Risk 1:** Scarcity of irrigation water due to droughts

**Risk 2:** ...



**Assumption:** Clogging of irrigation emitters of the drip irrigation system can be controlled ..

**Assumption:** ...

0 = no effect for reducing risk      3 = medium effect  
 1 = very limited effect              4 = high effect  
 2 = limited effect                      5 = very high effect

12

The assessment of the level of risk reduction focusses on the outcomes and effectiveness of adaptation in relation to the identified risk.



### Guiding questions:

- How effective would you rate the measure in reducing the identified risks?
- What would be the outcome of the measure (short term, long term)?
- How does the adaptation measure strengthen the resilience and adaptive capacity of the community?

- Analyse with the participants how effectively the identified adaptation measure options reduce risks by using worksheet 2 of handout 4.2

## Criteria 2 - Assess technical feasibility (slide 13)

Step 2. Assess adaptation options

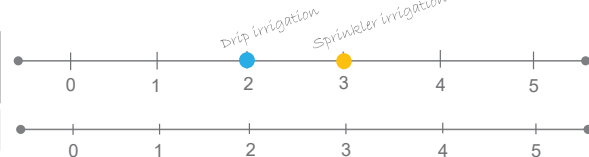
10 min, worksheet 3

### Criteria 2. Assess technical feasibility

- Analyse and discuss in group work how easy or difficult the implementation and operation of an adaptation measure will be regarding technical aspects (see helpful guiding questions in the handout)  
**Example:** Drip irrigation systems may clog more easily than sprinkler systems, depending on the water quality. In addition, drip irrigation may not be the best option for all crops and soil types.
- 💡 If you have difficulties with the evaluation, search for case studies of the measure options in your area.
- Insert your results in worksheet 3 and note down critical assumptions taken for the assessment. These will help later when evaluating the measures during implementation or operation.

**Risk 1:** Scarcity of irrigation water due to droughts

**Risk 2:** ...



**Assumption:** Iron content of irrigation water is very high and thus poses a risk of clogging for the drip irrigation system

**Assumption:** ...

0 = not feasibly                              3 = medium technical feasibility  
 1 = very limited technical feasibility    4 = high technical feasibility  
 2 = limited technical feasibility        5 = very high technical feasibility


13

The assessment of the technical feasibility focusses on the feasibility of the measure regarding technical aspects during its operation and implementation.



## Criteria 4 - Analyse costs and benefits (slide 15)

Step 2. Assess adaptation options



10 min, worksheet 5

### Criteria 4. Analyse costs and benefits


- Analyse and discuss in group work how high or low the costs and benefits of an adaptation measure will be (see examples for costs and benefits in the handout)
 

**Example:** *Drip irrigation systems usually require higher set-up and maintenance costs compared to sprinkler irrigation systems due to additional pre-treatment of irrigation water and/or additional installation of water pumps to maintain sufficient pressure throughout the drip line system.*
- Insert your results in worksheet 5 and note down critical assumptions taken for the assessment. These will help later when evaluating the measures during implementation or operation.


**Risk 1:** Scarcity of irrigation water due to droughts

**Risk 2:** ...

*Drip irrigation*



*Sprinkler irrigation*



**Assumption:** The irrigation of a large field is planned. In addition, the irrigation water must be pre-treated to avoid clogging.

**Assumption:** ...

0 = very cost-effective      3 = moderately expensive  
 1 = cost-effective          4 = expensive  
 2 = moderately cost-effective      5 = very expensive

15

The assessment of criteria 4 focusses on the qualitative analysis of the costs and benefits of a measure considering:

### Costs of adaptation include:

- Is it economically viable to implement? (Investment costs: e.g. purchasing, delivery, installation)
- Is it economically viable to operate and maintain? (Operating costs: e.g. required inputs (energy, labour), regular repairs)
- Is the measure reversible/flexible, e.g. are adjustments at a later point in time at low cost possible?


### Benefits of adaptation include:

- Additional costs savings (e.g., energy/water efficiency, labour productivity)
- Additional livelihood generation (e.g., new crop)
- Is it a no- or low-regret measure (measure is beneficial even if the predicted climate impacts do not occur)?

■ Qualitatively analyse how high or low the costs and benefits of an adaptation measure are by using worksheet 5 of handout 4.2.

## Criteria 5 - Assess social and environmental impacts (slide 16)

Step 2. Assess adaptation options



10 min, worksheet 6

### Criteria 5. Assess social and environmental impacts


- Analyse and discuss in group work the risks and associated impacts of an adaptation measure by determining the degree, duration, scale and probability of change in reference to the current status of the environment and stakeholders, e.g. local communities (see helpful guiding questions in the handout)
 

**Example:** *Dams are associated with a high negative impact on river ecosystems as they fragment the ecosystem, create a drier ecology downstream etc. Negative impacts on social, cultural and economic structures complete this list. In comparison, renaturation is the more attractive measure in this respect.*
- Insert your results in worksheet 6 and note down critical assumptions taken for the assessment. These will help later when evaluating the measures during implementation or operation.


**Risk 1:** Flooding of village

**Risk 2:** ...

*Dam*



*Renaturation*



**Assumption:** Reforested trees grow well and take root. ...

**Assumption:** ...

0 = very high impact      3 = limited impact  
 1 = high impact          4 = little impact  
 2 = medium impact      5 = very little impact

16

Environmental and social impact assessment identifies and evaluates the risks and associated negative and positive impacts of an adaptation measure on the current status of the environment and on stakeholders, such as local communities.

### Guiding questions for assessing environmental impacts:

- What are potential impacts of the measure on ecosystems (e.g. terrestrial, forest, marine, freshwater), biodiversity, water quality and aquatic ecosystems, soil?
- How many greenhouse gases and other harmful pollutants are emitted during implementation and operation of the measure?
- Does the implementation of the measure cause disturbing noise for others?
- What resources/chemicals and energy are required in the implementation and operation of the measure and what impact does their production/procurement have on the environment and society?

### Guiding questions for assessing social impacts:

- What are potential impacts of the implementation or operation of the measure on stakeholder groups? To better answer this question, ask yourself, who will be involved in, affected by and/or benefit of the measure? (How) does the measure help the most vulnerable and address gender issues, children, and elderly?
- What are potential impacts on socio-economic structures (e.g. employment, labour conditions, health systems, land ownership, cultural heritage)
- What are potential impacts on the existing infrastructure?


- Analyse and discuss with the participants the risks and associated impacts of the measure options by determining the degree, duration, scale and probability of change in reference to the current status of the environment and stakeholders, e.g. local communities (worksheet 6 of handout 4.2)

#### Hints:

- Make sure to consider both, negative and positive impacts.

### Criteria 6 - Assess acceptance and support (slide 17)

Step 2. Assess adaptation options



10 min, worksheet 7


## Criteria 6. Assess acceptance and support

- Analyse and discuss in group work how well the measure is accepted by the local community and whether there are support programmes that can be sourced (see helpful guiding questions in the handout)
 

**Example:** *The construction of farm ponds is directly supported and promoted through the support scheme NREGA offered by the Ministry of Rural Development, this is not the case for measures such as drip irrigation.*
- Insert your results in worksheet 7 and note down critical assumptions taken for the assessment. These will help later when evaluating the measures during implementation or operation.

**Risk1:** Scarcity of irrigation water due to droughts

**Risk2:** ...



**Assumption:** Less expensive

**Assumption:** ...

0 = not accepted and supported      3 = moderately accepted and supported  
 1 = very limited accepted and supported      4 = highly accepted and supported  
 2 = limited accepted and supported      5 = very highly accepted and supported

17

The selected measure needs acceptance by decision-makers and authorities and must comply with regulations and laws. Since it can only be realised if funds are available for its implementation, it is advisable to think about appropriate funding and support schemes as early as possible.



### Guiding questions for assessing acceptability:

- Is the selected measure in line with environmental pollution laws?
- Is the measure culturally appropriate and supported by the community? (e.g. religious, social, political etc.)
- Is it compatible with the actual local / indigenous practice, e.g. with past coping activities or adaptation measures?
- What is the acceptance of the measure in your community?

### Guiding questions for assessing supportive schemes:

- Do you have sufficient funds for implementing the measure?
- Are there any support schemes or programmes that could be sourced? For instance, is it likely that the Panchayat will support the implementation of the measure through MNREGA scheme and include operation and maintenance in the GPDP?

- Analyse with the participants the acceptability of and support for the measure options and insert your results in worksheet 7 of handout 4.2.
- Brainstorm with the participants on possible support schemes.

### Step 3. Selecting CCA measure(s) to be implemented

- Ask the participants to insert the identified measure options from Step 1 and their scores from Step 2 in the table below (see worksheet 8 of handout 4.2).
- Determine with the participants a final score for each measure by summing the results for each criterion in order to compare and to rank the measure options
  - The measure with the highest final score represents the best-fitting measure for implementation

ID	Adaptation measure options	Criteria						Final score	Prio	Notes and comments
		Level of risk reduction	Technical feasibility	Internal feasibility	Costs and Benefits	Social and environmental impacts	Acceptance and support			
1	Rainwater harvesting for groundwater recharge through infiltration ponds	5	5	3	5	5	4	27	1	...
2	.....									

### Useful literature and databases

- GIZ: Climate Expert: Case Studies.  
<https://www.climate-expert.org/en/home/case-studies/introduction-to-cases/>
- UNFCCC: Adaptation knowledge portal. Available at:  
<https://www4.unfccc.int/sites/nwptaging/Pages/Home.aspx>
- European Climate Adaptation Platform Climate-ADAPT: Adaptation options. Available at:

*<https://climate-adapt.eea.europa.eu/knowledge/adaptation-information/adaptation-measures>*

- Adaptation Technology Database by Asia Pacific Adaptation Network (APAN): Adaptation technologies database. Available at: *[http://www.asiapacificadapt.net/adaptation\\_technolog/](http://www.asiapacificadapt.net/adaptation_technolog/)*
- UNEP DTU Partnership: Technology Needs Assessment Database. Available at: *<https://tech-action.unepdtu.org/tna-database/>*

### **Key take-aways**

- When choosing the appropriate climate adaptation measure, it is important to consider its feasibility and impact on the environment and society in order to select the measures that best fit the local context and that can be implemented with the available resources.
- A combination of different measures from all three categories (grey, green and soft) is more effective in reducing risks than a single measure, as they each have different advantages and disadvantages and complement each other.
- It is advisable to look for measures that address multiple risks at the same time.
- Local best practices serve very well for inspiration and often address risks that also concern my own working environment.

### **Debriefing questions**

- What are your important take-aways/ messages from this case study?
- Did the session help you to select relevant CCA measures for your village/community?
- Which part of the exercise do you find most relevant for your work?



## Module 5. Designing climate change adaptation projects under GPDP

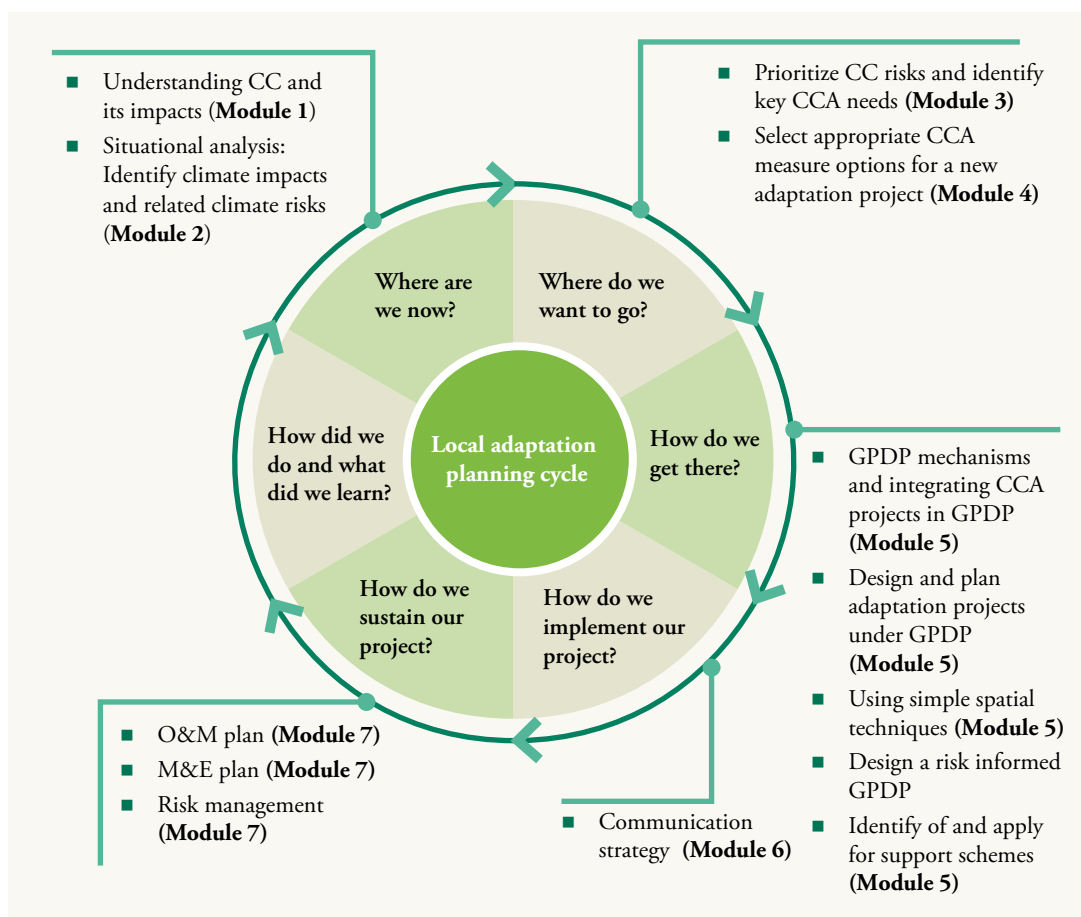
<b>Learning objective</b>	To know how to design an adaptation project, integrate it into GPDP planning processes and leverage various schemes
<b>Duration</b>	Shortest version: 9 h Complete version: 11 h

### Module planner

Duration	Sessions of module	Shortest version	Complete version
90 min	Session 5.1 Gram Panchayat Development Plan (GPDP) mechanism and integration of natural resource management (NRM) issues to address climate and disaster risk	×	×
60 min	Session 5.2 How to have a risk informed adaptation plan for integration into GPDP		×
3 h 30 min	Session 5.3 Design a project for selected adaptation measures that can be integrated into GPDP planning processes	×	×
60 min	Session 5.4 Use of simple spatial techniques for NRM planning	×	×
30 min	Session 5.5 Adaptation measures that can be leveraged through GPDP/MGNREGA vis-à-vis schemes and programmes	×	×
60 min	Session 5.6 Identifying further relevant support schemes for adaptation projects	×	×
60 min	Session 5.7 How to apply for the relevant schemes for CCA-DRR		×

### Integration of Module 5 along the local adaptation planning cycle

The methodology used by the Capacity Building Package follows the logical processes of local adaptation planning. The right figure shows the arrangement of the modules of the CDP, their main steps and methods employed. The colour green indicates that you are in Module 5 and Step 5 of the Local Adaptation Planning cycle, which enables PRI-members to design adaptation projects considering GPDP planning processes. For this, a fundamental understanding of the GPDP mechanisms and its linkages to NRM will be provided. Besides guidance on project designing and planning, skilled experts will gain insight into spatial techniques for NRM-based planning. After developing a project design, participants will link their adaptation actions to relevant support schemes and institutions and learn how to apply for them. In this module, special emphasis has been on GPDP and DRR linkages and the flagship MGNREGA programs.



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In the ExcelTool you will find a tab in the same colours. Here you can document the results achieved by your group of participants in module 5.

### Session 5.1 Gram Panchayat Development Plan (GPDP) mechanism and integration of natural resource management (NRM) issues to address climate and disaster risk

<b>Learning objective</b>	To use the GPDP mechanism to integrate NRM plans for addressing climate and disaster risk.	
<b>Prerequisites / prior knowledge for successful participation</b>	Prior knowledge on climate risk, vulnerability and PRA exercises.	
<b>Steps (duration)</b>	<b>Step 1.</b> Overview of the GPDP process and linkages with NRM	30 min
	<b>Step 2.</b> Linkages of the GPDP to the CCA-DRR concept	30 min
	<b>Step 3.</b> Scientific and evidence-based adaptation planning using the GPDP	30 min
<b>Total duration</b>	90 min	
<b>Methods/Exercises</b>	Input presentation; sharing experiences linked to GPDP	
<b>Material</b>	PowerPoint presentation 5.1, handout 5.1, Laptop, LCD projector	

#### Step-by-step approach

This session will provide PRI members with access to the complex GPDP process and the knowledge needed to link it to the disaster (DRR) and climate change risk needs of local people. Step 1 will provide a general approach to the Panchayat and GPDP on its components, structure/plan cycle and funding options. Step 2 focuses on the linkage between the GPDP and disaster risk management/ disaster risk reduction. To conclude the session, Step 3 uses a case study to show how scientific and evidence-based adaptation can be planned using the GPDP.



## Step 1. Overview of the GPDP process and linkages with NRM

- Present slides 3-7 (presentation 5.1 – GPDP mechanism and integration of NRM) to the participants.

Panchayats are the building blocks for the decentralised planning process in India. The bottom up approach informs the policy, programs and priorities of the national and state governments. Increasingly international commitments under SDG, Sendai Framework for DRM issues and Paris agreement for climate change issues are getting integrated in GPDP.

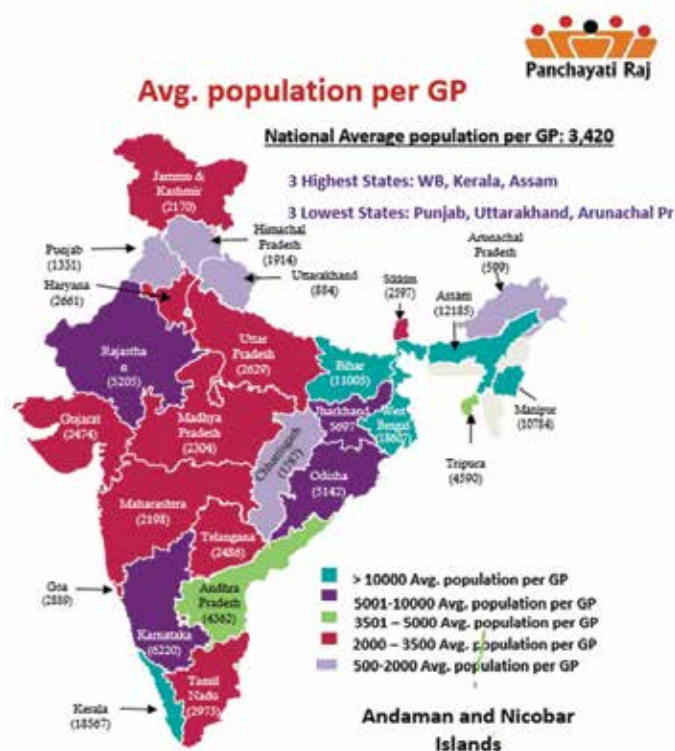
The village plan is not a new concept, however in recent years the participation of people in the planning process (as opposed to the top-down planning), resource devolution and convergence of schemes to avoid duplication has been the focus.

Article 243G of the Constitution provides for: “Powers, authority and responsibilities of Panchayat. Subject to the provisions of this constitution, the legislature of a state may, by law, endow Panchayats with such powers and authority and may be necessary to enable them to function as institutions of self-government. Such laws may contain provisions for the devolution of powers and responsibilities upon Panchayats, at the appropriate level, subject to such conditions as may be specified therein, with respect to the preparation of plans for economic development and social justice. The implementation of schemes for economic development and social justices

may be entrusted to them including those in relation to the matters listed in the Eleventh Schedule. GPDP is a holistic and comprehensive decentralized plan at the village (gram panchayat) for the people and by the people to meet local needs in 29 subjects by converging all schemes and funds.

Linkages of the GPDP to NRM: The subjects listed from 1-7 are part of the NRM discourse in GPDP. Similarly items 8-15 are related to infrastructure that needs to be resilient to address climate stress and disaster. Items 16-29 have strong linkages to response capacity of the community.

Figure 23. Average population per GP



Source: Ministry of Panchayati Raj, Govt of India

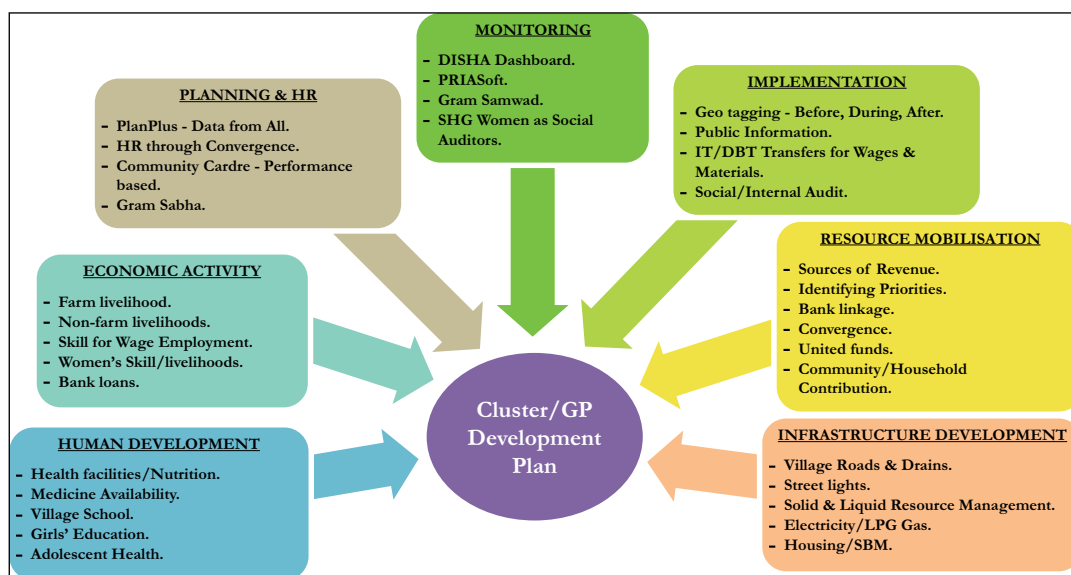
Figure 24. Subjects of GPDP

1. Agriculture.	6. Social Forestry.	11. Drinking Water.
2. Land Improvement.	7. Minor Forest Produce.	12. Fuel and fodder.
3. Minor Irrigation.	8. Small scale industries.	13. Roads.
4. Animal Husbandry.	9. Khadi, village and cottage industries.	14. Rural Electrification.
5. Fisheries.	10. Rural Housing.	15. Non-conventional energy.
16. Poverty alleviation programme.	21. Culture activities.	26. Social welfare.
17. Education.	22. Markets and fairs.	27. Welfare of the weaker sections.
18. Vocational education.	23. Health and sanitation.	28. Public distribution system.
19. Adult and non-formal education.	24. Family welfare.	29. Maintenance of community assets.
20. Libraries.	25. Women and child development.	

Source: GPDP Handbook

Key **components** of the planning process are given below:

**Figure 25.** Key components of the GPD planning process



Source: Ministry of Panchayati Raj, Government of India (2018), GPD Handbook

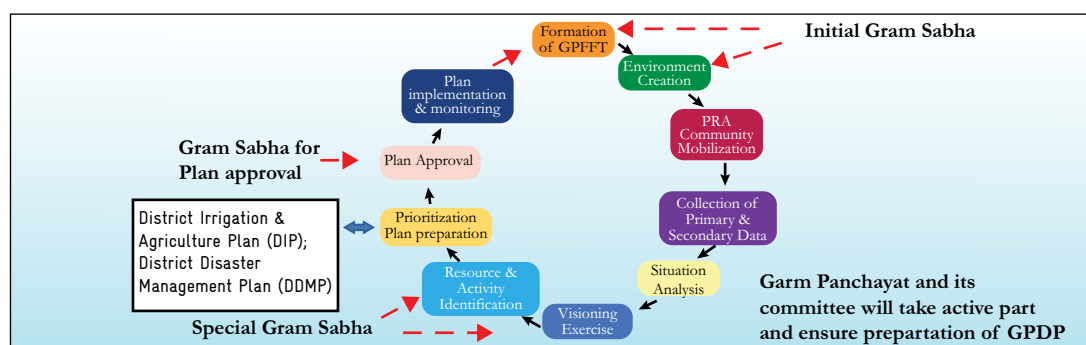
Key **stakeholders** that are involved in the planning process are as follows:

**Table 7.** Key stakeholders involved in the planning process

Elected representatives	Functionaries (frontline workers of mission mode programs)	Others
<ul style="list-style-type: none"> <li>■ Mukhiyas/ UP Mukhiyas/ Pradhans</li> <li>■ Traditional heads of PESA panchayats</li> <li>■ Ward members</li> <li>■ Members of standing committees of Gram Sabha</li> </ul>	<ul style="list-style-type: none"> <li>■ Panchayat secretaries</li> <li>■ Rozgar sewaks of MGNREGA</li> <li>■ Asha workers</li> <li>■ Jal sahiyas</li> <li>■ Anganwari supervisors</li> <li>■ Cluster coordinators under SSA</li> <li>■ Sahiyas/ANMs</li> <li>■ Clustre coordinators under SBA</li> <li>■ Charge officers</li> </ul>	<ul style="list-style-type: none"> <li>■ Women collectives of NRLM and other programs</li> <li>■ NGO partners if any</li> <li>■ Members of PPT</li> <li>■ Community members – members of Gram Sabha and children/child representatives</li> <li>■ Master trainers/resource persons</li> </ul>

**Plan cycle** of GPD has been given below:

**Figure 26.** Plan cycle of GPD



Source: GPD handbook diagram modified by CTRAN

The opportunity for linking NRM issues in GPDP serves as an input for District Irrigation Plan, that aggregates crop-based water demand from GPs to create irrigation infrastructure. The inputs also help in preparing comprehensive district agriculture plan, village water security plan, etc. Similarly, section 32 of the Disaster Management Act, 2005 empowers local bodies like gram panchayats to articulate the requirements for responding/preparing for disasters that goes as input to disaster management plan of the district and states. This has been discussed in the following sections.

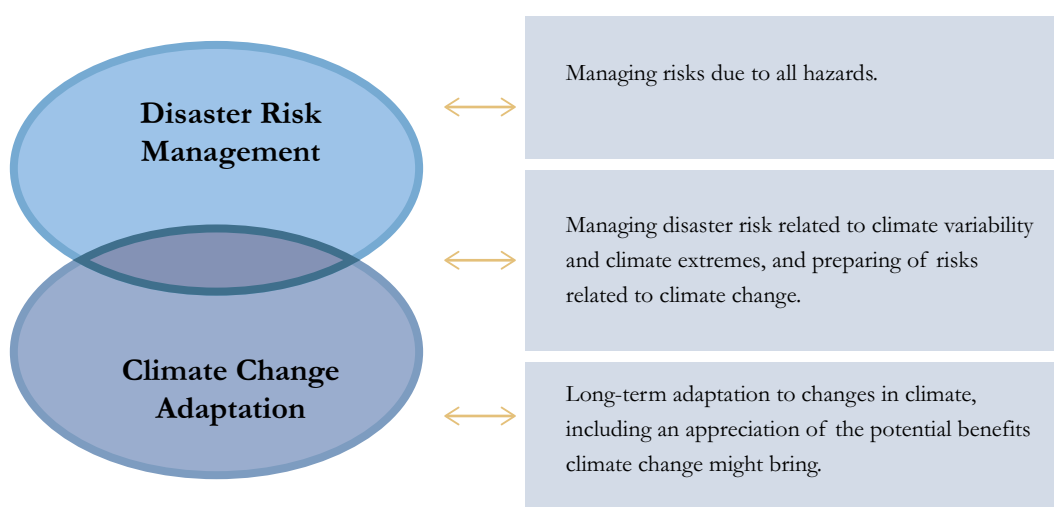
## Step 2. Linkages of the GPDP to the CCA-DRR concept

- Present slides 8-10 (presentation 5.1 – GPDP mechanism and integration of NRM) to the participants.

During the preparation of GPDP, communities should be motivated to make their own short term and long-term Disaster Management Plans for Disaster Mitigation for which GP need to lead from the front in building their capacities. GPs should consider about integration of disaster preparedness plan in GPDP particularly in disaster prone areas. Most of the districts in HP have integrated Hazard Risk Vulnerability Analysis (HRVA) in their respective disaster management plan. During visioning exercise and situation analysis in GPDP, effort should be made to synergize effectively to tap the traditional wisdom of the local communities and complement the modern practices in the disaster mitigation efforts. A synergic approach involving elected representatives along with civil society initiatives like NGOs and CBOs, would provide a broad-based framework for disaster reduction and mitigation. During data collection process, information and data on disaster preparedness should be collected.

People are aware of risks due to disaster, and they react, but adaption needs due to climate change is relatively long term and planning for that is relatively difficult because of uncertainty associated with it. Risk reduction and climate change adaptation are relatively not new for India, however the combination or integration of both could be a new approach. With past efforts both by NDMA, NIDM, Ministry of Earth Science and MOEF knowledge of historical risk and expected future climate impacts is now available for further long-term planning. GoI has effectively invested in research to identify the priority areas and sectors that would be hit the hardest up until 2050s. Most of the State governments now have the state disaster management authority, the apex body for DRRM, so do they have state level climate action plans. The challenge is the execution of adaptation activities by two different institutions, which sometime leads to duplication or confusion at the local level.

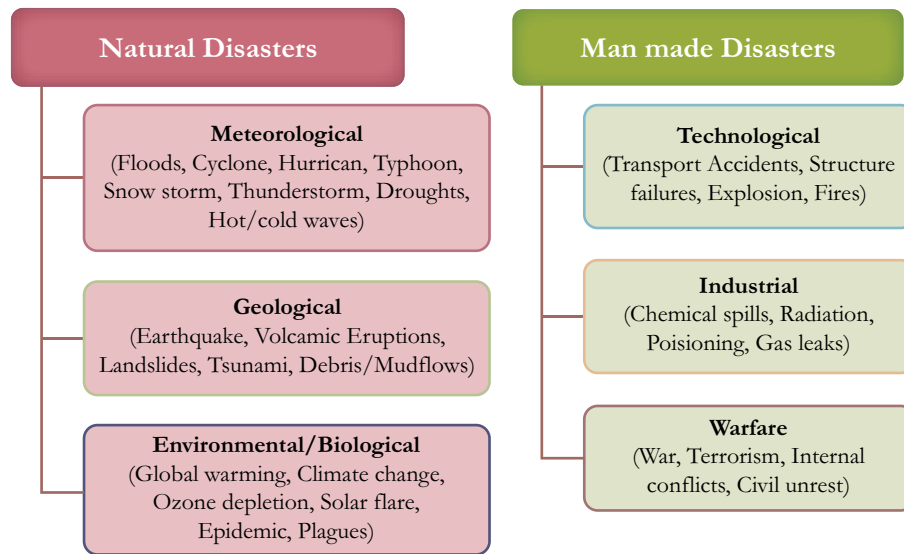
**Figure 27.** Interlinkages between disaster risk management and climate change adaptation



*Adaptated from Mitchell and van Aaist, 2008*

## Types of Disasters

Figure 28. Types of disasters

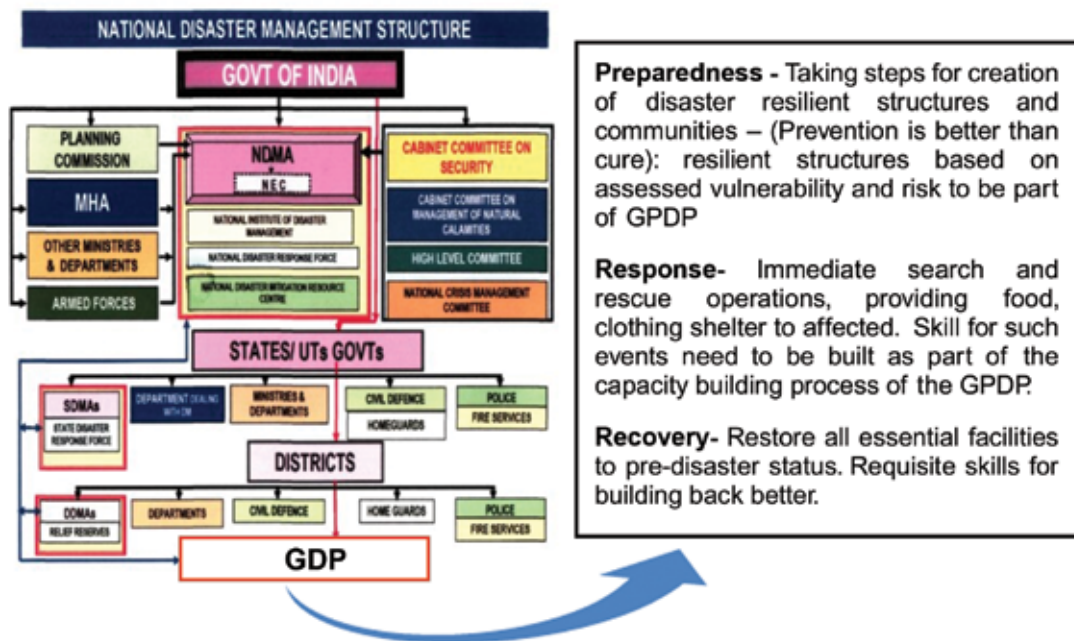


Source: <https://www.asosajournal.org>

## Institutional architecture for DRR and its interface with GPDP

The institutional architecture in India has well evolved as compared to the climate change related institutional architecture. GPDP is the first point in the planning process to feed into district plan, district disaster management plan leading to state disaster management plan. Several structural measures and non-structural measures are integral to disaster management planning as well as climate change adaptation.

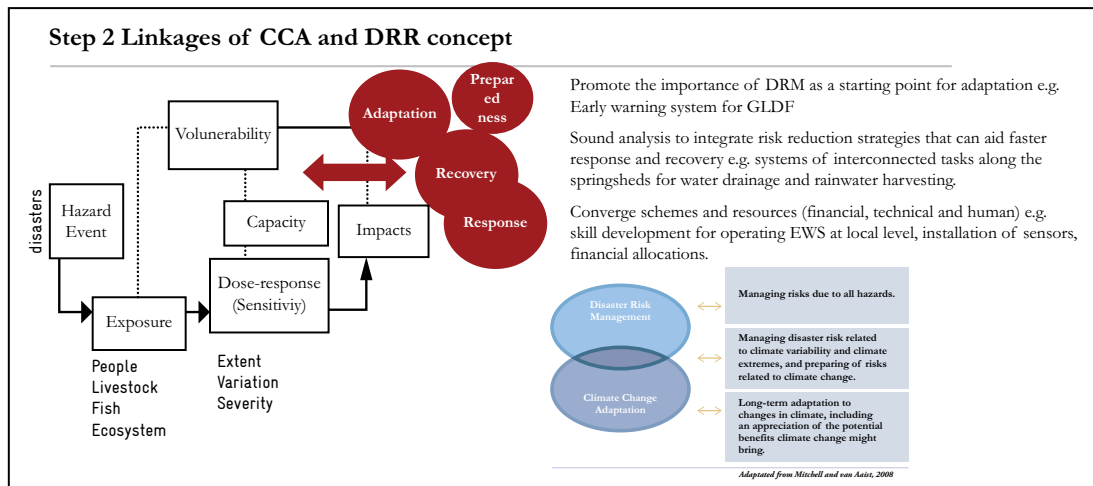
Figure 29. National disaster management structure



Source: National Disaster Management Authority

## Integration of NRM issues in GPDP through CCA-DRR lenses

The following slides show the linkages between the CCA-DRR and the institutional architecture for disaster management.



Mainstreaming disaster management into the development planning process essentially means looking critically at each activity that is being planned, not only from the perspective of reducing the disaster vulnerability of that activity, but also from the perspective of minimizing that activity's potential contribution to hazard specific vulnerability. CCA and DRR are cross cutting concepts and requires multisectoral and multi-agency convergence. The expected benefits of mainstreaming climate change adaptation and disaster risk reduction into development activities include avoided policy conflicts; reduced risks and vulnerability; greater efficiency compared to managing CCA and DRR in silo. Both structural and non-structural measures that can help the community better prepare (capacity to respond and post disaster recovery) should be part of GPDP. It should look into current and future vulnerabilities and find out the gap in infrastructure, institutions and skills suggesting such measures.

### Step 3. Scientific and evidence-based adaptation planning using the GPDP

- Present slides 11-15 (presentation 5.1 – GPDP mechanism and integration of NRM) to the participants.

Linking CCA-DRR concept in the planning processes requires three key elements (a) a scientific assessment of the climate risk at the local level (b) participatory process to sensitise the people which is called environment creation (c) identify and prioritise various structural and non-structural adaptation measures to address such risks. The case study below shows how the climate risks arising out of glacial lake outburst flood (GLOF) and moisture stress related adaptation can be planned and integrated in GPDP.

#### Case study

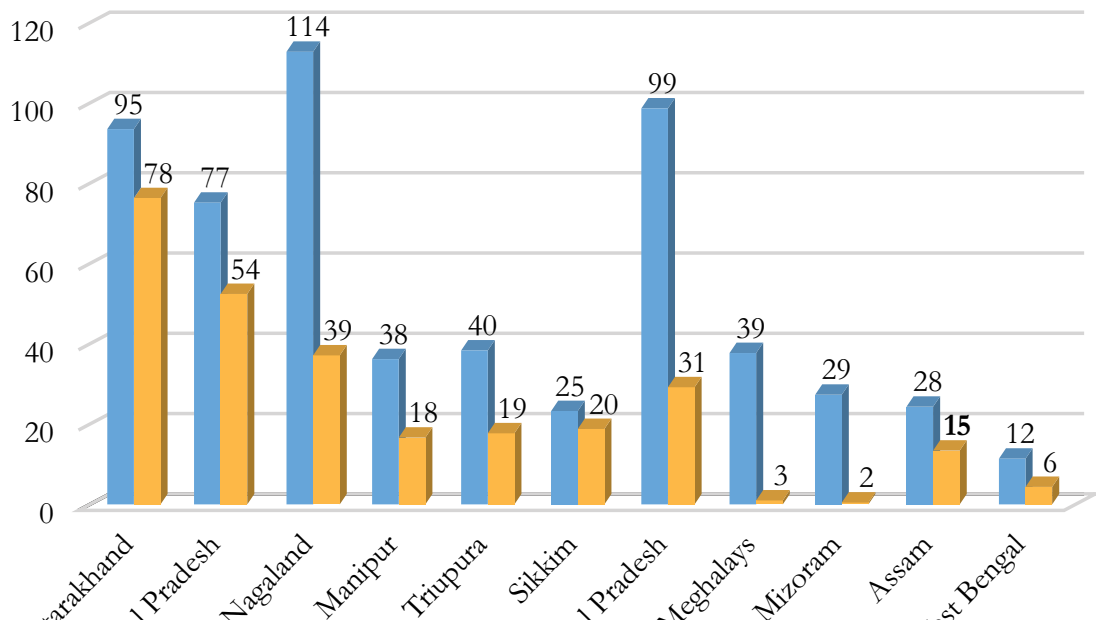
Glacial outburst and flood events threaten, life and livelihood and infrastructure in Himachal Pradesh. Rise in temperature has not only enhanced the formation of new lakes and such events are occurring more frequently. Similarly, erratic nature of monsoon and rise in temperature gas affected several springs and they are drying. The following slides show how the adaptation actions are being planned in HP based on scientific assessment of GLOF risk, and water scarcity.

The following section provides how NRM issues can be integrated in GPDP through CCA-DRR lenses.

Himachal Pradesh in the Himalayan Region faces both flash floods and water scarcity. The dominant water sources in the area are spring sheds (42 deep tube wells and 34 springs and deep tube wells. Out of the 77 total mapped blocks in HP 54 are water starved.

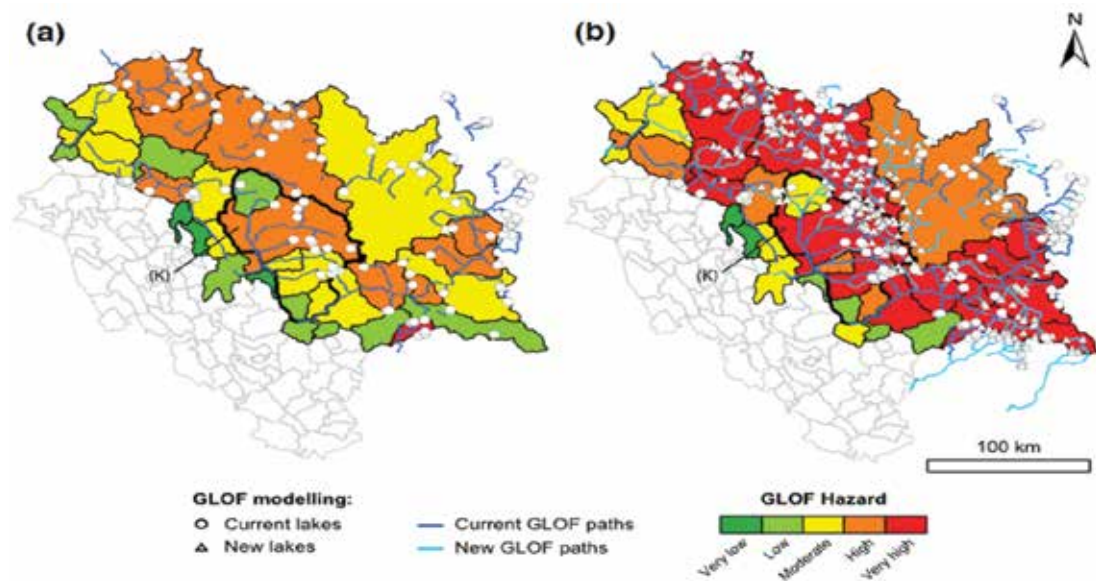
Climate change has caused rise in temperature and drying of springs as well as a greater number of GLOF events.

### WATER SCARCITY INDEX MAPPING



Source: GB Pant University Jal Abhiyan Report

**Figure 30.** GLOF hazards in Kullu

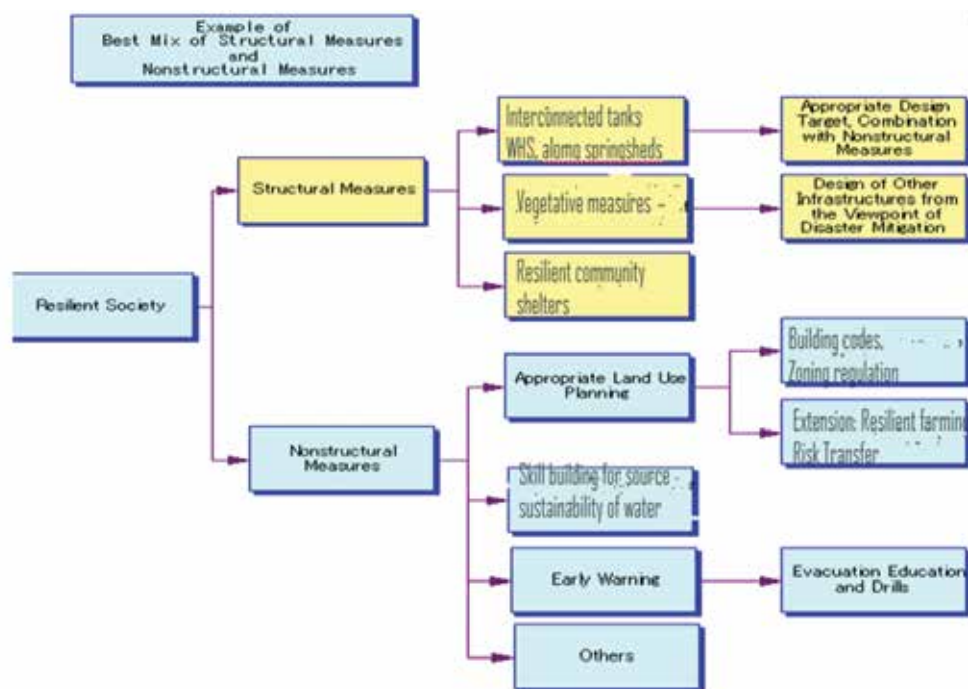


Source: Allen et.al

For example, shown above, the analysis shows in the central area of Kullu, a 7-fold increase in the probability of GLOF triggering and a 3-fold increase in the downstream area affected by potential GLOF paths can be anticipated, leading to an overall increase in the assigned GLOF hazard level from ‘high’ to ‘very high’. In such instances, strengthening resilience and capacities to reduce the current GLOF risk will provide an important first step towards adapting to future challenges.



Figure 31. Structural and non-structural measures of GDPD



Source: CTRAN

Based on this scientific evidence several structural and non-structural measures can be planned and integrated into the GDPD.

### How DRM issues can be mainstreamed by DRM experts into GDPD processes

Figure 32. How DRM issues can be mainstreamed by DRM experts into GDPD processes



Source: OECD

## Group discussion

Encourage the participants to share their experiences on how they can link this to GPDP

### Guiding questions:

- What actions do you take to prepare for and/or reduce impacts of disasters on your village?
- Will some actions that you took help in Short Term (list) and what will help in Long Term to reduce the effect?
- Are you aware of district disaster management plan of your district?
- Did you participate in planning, training? If so, please list the topics.

## Useful literature and databases

- People's Plan Campaign for Gram Panchayat Development Plan (GPDP) 2021-22. [https://gdpd.nic.in/resources/PPC-2020\\_Booklet.pdf](https://gdpd.nic.in/resources/PPC-2020_Booklet.pdf)
- Allen et al. (2016): Glacial lake outburst flood risk in Himachal Pradesh, India: an integrative and anticipatory approach considering current and future threats. Available at: [https://www.researchgate.net/publication/306009887\\_Glacial\\_lake\\_outburst\\_flood\\_risk\\_in\\_Himachal\\_Pradesh\\_India\\_an\\_integrative\\_and\\_anticipatory\\_approach\\_considering\\_current\\_and\\_future\\_threats](https://www.researchgate.net/publication/306009887_Glacial_lake_outburst_flood_risk_in_Himachal_Pradesh_India_an_integrative_and_anticipatory_approach_considering_current_and_future_threats)
- Asosai Journal: Audit of Disaster Management: An Experience of SAI Nepal. Available at: <https://www.asosaijournal.org/audit-of-disaster-management-an-experience-of-sai-nepal/>
- OECD (2018) OECD Environment Policy Paper No. 14

## Key take-aways

- The process described in this module shows how the GPDP planning process can integrate proactive adaptation measures that can address disaster risk for the area.
- There is some degree of overlap between CCA-DRR and this needs to be clearly articulated
- The tool (in the case-study) encourages participants in thinking through these linkages in the CCA-DRR framework of the country
- The tool encourages participants to fine tune action plans by assessing alternatives
- Focus on addressing how the benefits can accrue to community and individuals both in short run and long run especially during and after disasters

## Debriefing questions

- What are your important take-away messages from this session?
- Do you know how and do you plan to apply the key concepts provided by this session to your work?



## Session 5.2 How to have a risk informed adaptation plan for integration into GPDP

<b>Learning objective</b>	To integrate a risk informed adaptation plan into GPDP.	
<b>Prerequisites / prior knowledge for successful participation</b>	Understanding on climate risks/hazards/disasters and activities to address them. Understanding the concept of climate resilient works	
<b>Steps (duration)</b>	<b>Step 1.</b> Revisiting risk and vulnerability	30 min
	<b>Step 2.</b> Suggested adaptation measures informed through risk and see if the work is climate resilient	30 min
<b>Total duration</b>	60 min	
<b>Methods/Exercises</b>	Input presentation; discussing risk-informed village plans under GPDP using a case study on farm ponds	
<b>Material</b>	PowerPoint presentation 5.2, handout 5.2, Laptop, LCD projector, video on best practices	
<b>Preparation of the material</b>	Prepare an up-to-date composite vulnerability map and matrix for the state. Inform and adapt the case study to the local context of the participants to educate them on how their area will plan to adapt to the emerging long-term risk.	

### Step-by-step approach

This session guides PRI-members in developing a risk informed plan to address CCA-DRR issues in the area. **Step 1** of this exercise is meant to relate and compute the long-term risk (Mid-century) at the local level. **Step 2** involves various structural and non-structural measures that are climate resilient. It also requires a creative thinking on part of the villagers to suggest measures that can address some of the risks through minor modifications of design.

### Step 1. Revisiting risk and vulnerability

- Present slides 3-6 (presentation 5.2 – Risk informed GPDP plan) to the participants.

Figure 33. Himachal Pradesh current and projected vulnerability

Districts	Himachal Pradesh Current and Projected Vulnerability																	
	Composite Vulnerability Index (CVI)						Water Resources VI (WRVI)					Health/Extreme Climate VI (CLVI)						
	BL Rank	BL	MC	EC	MC	EC	BL Rank	BL	MC	EC	MC	EC	BL Rank	BL	MC	EC	MC	EC
Lahul & Spiti	1	VL	VL	VL	VL	VL	1	VL	VL	VL	VL	VL	1	VL	VL	VL	VL	VL
Kinnaur	2	L	L	L	L	L	10	VH	VH	EH	VH	EH	3	VL	VL	VL	VL	VL
Solan	3	L	L	L	L	L	9	VH	VH	VH	H	H	8	H	H	H	H	VH
Kullu	4	L	L	L	L	M	4	M	H	H	H	VH	2	VL	VL	VL	VL	L
Shimla	5	L	L	L	L	L	8	H	H	H	H	H	4	L	L	L	L	M
Hamirpur	6	M	M	M	M	M	2	L	L	L	L	L	11	H	VH	VH	VH	VH
Mandi	6	M	M	M	M	M	11	VH	VH	VH	VH	H	6	L	M	M	M	H
Kangra	8	M	M	M	M	H	5	H	H	H	H	H	7	M	H	H	H	H
Una	9	M	M	M	M	M	3	L	M	L	L	L	12	VH	VH	VH	EH	EH
Bilaspur	10	H	H	H	H	H	12	VH	EH	VH	VH	VH	9	H	H	H	H	VH
Sirmaur	11	H	H	H	H	H	6	H	H	H	H	H	10	H	H	VH	VH	VH
Chamba	12	VH	EH	EH	VH	EH	7	H	VH	VH	H	EH	5	L	M	M	M	M

BL: situation now baseline, L:Low, M: Medium, H: High, H: High, VH: Very High

Use this column, VL=1, L=2, M=3, H=4, VH/EH=5

The above table shows the vulnerability scores (composite) of all the districts. The participants can find out the vulnerability of their area (from the district score).

**Hazard:** Next important process is to identify various hazards in that area. The participants can be asked to construct a hazard line for the area. They need to remember and show as a score the number of events in last 20 years. Drought, Flood and both event (Drought and Flood). The number of events in 20 years (High=if more than 10 events, M=more than 5 less than 10, Low=0-4 number of events. The score for High=5, Medium=4, Low=3. The same score applies for both the events.

**Exposure:** Look at the map below for the **population density** of your area.

Figure 34. Map of Himachal Pradesh



Source: SPA (2014) Block and Panchayat Development Plan, 2022

If >225 then the score is high=5 if your area is between 100-224 medium=4 if less than 100=3

Computing the **risk** of your area: Hazard X Exposure X Vulnerability

Divide the scores that you obtained into 3 separate classes. Let's say group came up with the scores for several places. If more than average Risk score then High, if it is around average=M if it is much lesser than average=Low (ideally it is done by using 1 times standard deviation from average as medium and 2 times standard deviation from average either more or less as high and low).

Once you find the area risk score, the idea is to find out what are the **indicators** in the impact chain that can reduce such risks and adaptation actions can be structured.

In the case of HP, the since flash flood and drought contexts have been chosen. The following indicators may be **useful to reduce sensitivity**.

- Net Irrigated area
- Ground water recharge
- Forest conservation



In **capacity enhancement** the following indicators may be considered.

- Membership in SHG/FPO
- Multi-purpose community house (used during flood for shelter, Input/Output storage, GP meetings)

## Step 2. Suggested adaptation measures informed through risk and see if the work is climate resilient

- Present slides 8-9 (presentation 5.2 – Risk informed GPDP plan) to the participants.

The following checklist can be used to identify **some of the structural measures (community works) to be integrated into the GPDP**. Most of these works are climate resilient, but participants can use the CRW checklist for prioritisation.

**Possible risk Informed CCA measures**

Risk/Indicator Class	Drought	Flood	Both events
<b>Net irrigation</b>			
High	1. Contour bonds 2. Farm Ponds 3. Community wells 4. Interconnected wells 5. CAD works	1. Link drains 2. Diversion weirs 3. Deepening of flood channels 4. Connected RWH	1. Connected RWH
Medium	1. Farm ponds 2. CAD works 3. Contour bonds	1. Link drains 2. Deepening of flood channels	1. Connected RWH
Low	1. CAD works	Routine inspection of flood channels	
<b>Ground water</b>			
High	1. Contour Bunds 2. Recharge pits 3. Staggered trench	1. Cross bunds	
Medium	1. Staggered trench 2. Recharge pits	1. 1. Artificial recharge shafts	
Low	1. Recharge pits		
<b>Forest Conservation</b>			
(all risk classes)	1. Afforestation 2. Grass land development 3. Road/canal side plantations	1. Plantation 2. Bio-drainage	1. Plantation 2. Grassland development

### Group exercise (slide 9)

- Ask the participants to use the checklist above to identify the resilient works based on their risk category. See what risk category your area belongs to and accordingly find out what measures are suitable for which risk.

For these actions, the relevant schemes have been discussed in the earlier modules. That can be converged. However, the climate resilience work framework may be used for prioritisation and modification of the designs.

**Durability:** This aspect is key to a climate resilient work. For e.g. a water harvesting structure like farm pond captures excess rainfall, conserves soil moisture, improves groundwater recharge.

### Case study example

Farm pond can be made on any and every crop field. It should be made in the farming area, so that protective irrigation can easily be given and the site should be relatively flat. Farm ponds should be constructed in a cluster basis, so that the overall soil moisture regime of the area will be enhanced and water will be available for longer period of time. The catchment area of the site should not be more than 2 ha. In case there is a well on the farm, the pond should be made upstream of it so that the well may benefit from recharge from the pond. The size of the pond needs to be calculated on the availability of runoff water and volume of water requirement.

If we want to provide 10 cm of protective irrigation to the crop over 1 hectare, we need 1000 cum of water. Volume of water required = Area to be irrigated x depth of irrigation = 1 hectare x 10 cm. = 10,000 sq.m. x 0.1m. = 1000 cum. Pond whose dimension is 25m x 20 m x 2.5 m will yield this amount of water. It will occupy 25m. x 20m. = 500 sq.m. in 1 hectare, i.e., 5% of the area to be irrigated (500/10,000 = 5%).

In climate resilience consideration historical rainfall and its variability (co-efficient of variation) need to be taken into consideration for the design.

Some of the design changes that can enhance durability are as follows:

- Grass seeding on the bunds to arrest soil erosion (as the velocity of water is high in the hills)
- Inlet construction to channelize run-off to the farm ponds
- Outlet for safe discharge of excess run-off water especially beneficial if it is in a cascade and the fields are connected
- Silt traps to reduce silt loads
- Bund plantations

These farm ponds can help both in flood and drought conditions.

Similarly, a **multipurpose building** constructed for the purpose of gram panchayat, the design can be tweaked to make it two floors and with raised platforms to can help in flash flood for shelter as well as storage of inputs and outputs.

The funds can be suitably converged from individual as well as community schemes for this purpose and it has required flexibility.

These kinds of work benefit both men and women and are inclusive in nature.

#### Hint for the trainer

- Trainer can take the participants through the exercise mentioned above to explain how risk informed planning is different from conventional GPDP planning. The key difference is the focus of risk informed plan is to link with local climate stress or disasters while other conventional planning may include these aspects and many times these are ignored (many time (focus is on cultural centre, may be a school but if these are to be linked to risks, then these can be redesigned as a shelter/and storage at the time of crisis.
- <https://www.youtube.com/watch?v=zwaR1WAc-mg&list=RDCMUCLicGPL5tTD23FvCDFOhrOA&index=6>
- You can show the video of these best practices and discuss what is the learning

#### Useful literature and databases

- Government of India, Ministry of Rural Development (2009): Guidelines for Convergence of NREGS with Programmes of Ministry of Agriculture for enhancing productivity. Available at: [https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline\\_conver\\_MOA.pdf](https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline_conver_MOA.pdf)
- Department of Environment, Science and Technology, Government of Himachal Pradesh (2012): State Action Plan on Climate Change, HP. Available at: [https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf)
- Technical Manual NREGA
- PMKSY Division, Ministry of agriculture and farmers welfare (2019): Guidelines. Available at: <http://pmksy.gov.in/Guidelines.aspx>



- SPA (2014) Block and Panchayat Development Plan, 2022
- GiZ (2018) Climate Change Impact and Vulnerability Assessment, HP
- Government of Himachal Pradesh, Rural Development Departments: Schemes and Programmes for HP. *Available at: <https://hprural.nic.in/Schemes.htm>*
- Department of Agriculture, Himachal Pradesh (2017): A farmer friendly handbook, Schemes and Programmes 2017. *Available at: <http://farmer.gov.in/imagedefault/handbooks/FFH-2017HimachalPradesh-English.pdf>*
- Please also check the scheme inventory handout with links to further schemes

### **Key take-aways**

- Participants learn to distinguish between a normal planning process and risk informed planning process.
- Participants understand the difference between planning of a normal structural measure and its variation to make these structures climate resilient.

### **Debriefing questions**

- See whether anybody has looked at any structure that are resilient
- Did they use any modern or traditional knowledge to make the structures resilient?
- Whether these issues have been discussed with community.



## Session 5.3 Designing a project for selected adaptation measures that can be integrated into GPDP planning processes

<b>Learning objective</b>	To design a need-based project on village level that can be integrated into GPDP.	
<b>Prerequisites / prior knowledge for successful participation</b>	Climate risks, CCA needs, and measures are identified (Module 2, 3 and 4). Knowledge of planning cycle of GPDP, structural and non-structural measures and climate resilient works. The participants should familiarise themselves about their sectoral issues (water) related and they also need to have basic understanding of PRA exercises.	
<b>Steps (duration)</b>	<b>Step 1.</b> Review and outlook: local adaptation planning cycle	30 min
	<b>Step 2.</b> Developing a basic project design for selected CCA measures (objectives, outcome, output)	60 min
	<b>Step 3.</b> Developing an action plan (tasks, timeline, roles, resources)	120 min
	<ul style="list-style-type: none"> <li>a. Developing a generic action plan</li> <li>b. Specific processes for development of village level action plan (sectoral) that goes into the GPDP</li> </ul>	
	<b>Step 4.</b> Database generation for adaptation planning	60 min
<b>Total duration</b>	4 h 30 min	
<b>Methods/Exercises</b>	Input presentation, reviewing prior key results, determining results chain, developing an action plan, visioning exercise for a water project and database generation for adaptation planning using the example of water budgeting	
<b>Material</b>	PowerPoint presentation 5.3, handout 5.3, Laptop, LCD projector, flip chart or wall to pin cards on	
<b>Preparation of the material</b>	You may adapt the examples provided that facilitate the exercises in this session to the participants' context.	

### Step-by-step approach

After identifying, assessing and prioritizing a climate risks, adaptation needs and concrete adaptation measures (Module 4), this module deals with the design of adaptation projects aimed at reducing the identified climate risks.

The project design presented in this session is a four-step process that helps the community create the “backbone” of their adaptation project, beginning with a brief review of previous modules and an outlook on upcoming ones (**Step 1**). In a review exercise, participants will reflect on their collected findings on climate impacts, risks, adaptation needs and selected adaptation measures and adjust them if necessary. The module continues with the development of a basic project design (**Step 2**). Here, an overarching goal or vision of how participants want to see their future in relation to the identified climate risk is identified, and a results chain is created. In **Step 3**, participants develop necessary tasks, their phasing, and resources to achieve the defined goals and objectives. Step 3 first addresses the development of a general action plan, and then looks at the key processes for developing a village action plan for GPDP.

The concepts used in this session need not be new to participants. Defining goals, developing an action plan, and other aspects of project design may have already been learned in other contexts. However, in this session, participants will have the opportunity to clarify concepts, talk with each other purposefully, and work through the design process by practically planning an adaptation project for their community. At the end of the session, the participants will move one step closer to prepare a risk informed village level action plan that will fit into the GPDP. How the adaptation project could possibly be funded, will be looked at in the next Sessions 5.5 (with a special focus on MGNREGA), 5.6 (further support schemes) and 5.7 (the application procedure).

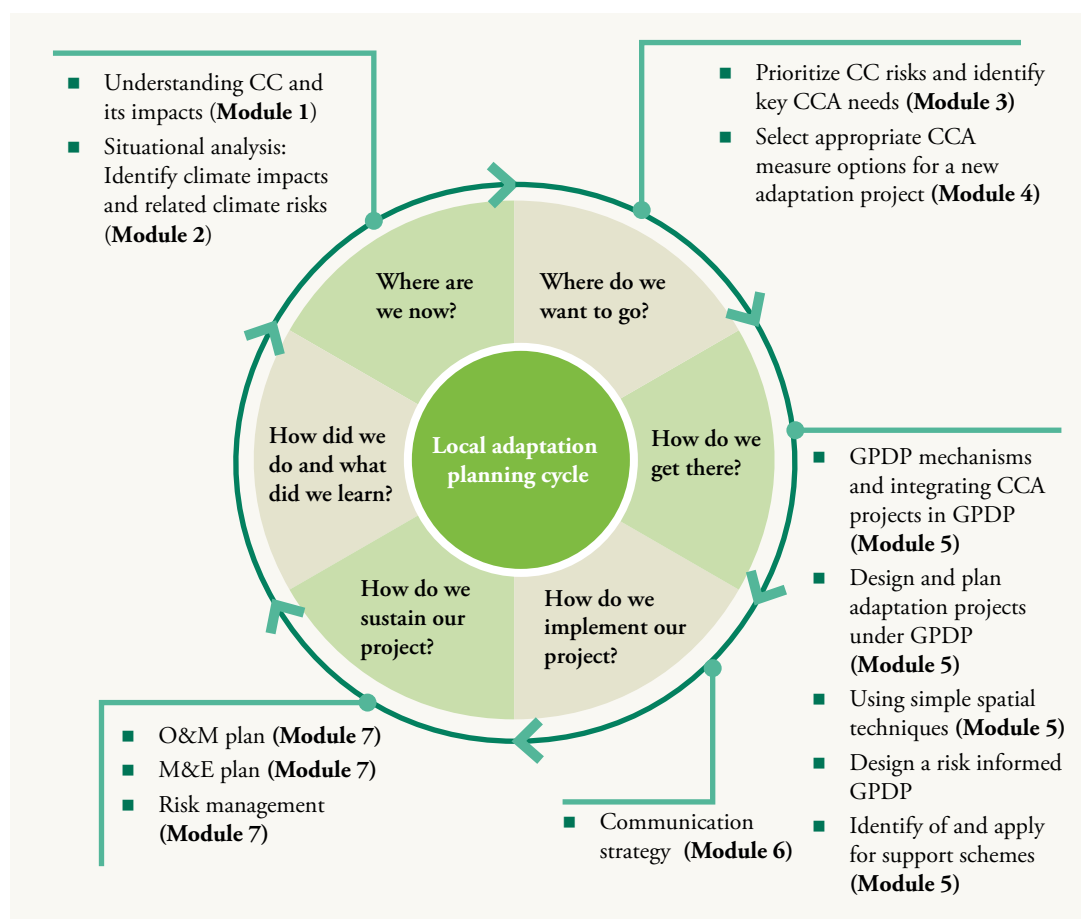


## Step 1. Review and outlook: Generic local adaptation planning cycle

### Input presentation

- Present slides 3-6 (presentation 5.1: designing a project for selected adaptation measures) to the participants.

**Figure 35.** Arrangement of the CDP's modules along a general local adaptation planning cycle



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The cycle shown in Figure 1 illustrates the relationship of the different steps/phases in project development for climate adaptation, with one step neatly following another. In fact, a project rarely develops in such a pattern - steps can happen simultaneously and it may be necessary to take a step back to reconsider or redo something. The present capacity building package comprising several modules also follows these logical sequences of project planning.

You can present this overview to the participants to give them an understanding of project development/planning. The circle diagram also gives a very nice overview of what and what results have been achieved in previous modules, where the participants are currently in project development/planning (Module 5) and what they can expect from Module 5 and the next modules 6 and 7.

**Review exercise – Review your climate impact – risks – CCA needs – CCA measures chain identified in prior modules**

**Time: 30 min**

At the beginning of the session, discuss and evaluate with the participants the state of their results gained in the previous modules/sessions. For the exercises in this session to be successful, it is important that participants are aware of climate risks relevant to them and have concrete ideas for an adaptation project (adaptation needs are identified and measure options are assessed and selected). If participants are undecided about which CCA measure options they want to realize with a CCA project, you may repeat exercises from modules 2, 3 and 4 with the participants depending on their specific training needs.

- Ask the participants to reflect on the climate impacts and related risks identified in Module 2. Engage them to recreate their climate impact chain, similar to the one below by writing down climate impacts (remember, there are direct and indirect impacts) and prioritized risks (most relevant negative effects on the participants) on **red cards**.
- After the participants reflected on their climate impact chains ask them to write their key adaptation needs to minimize the identified climate risks on **yellow cards** and to add them to their climate impact chain. The adaptation needs result directly from the risks and describe broad solutions at this point. Help participants think “big picture” to define their needs.
- Finally, ask participants to write down specific adaptation options on **green cards**. These will also be added to the overall picture as shown in the visualization example below.
- To collect their results, participants can use worksheet 1 of handout 5.1.

**Hint for the trainer**

- The resulting overview is a perfect start for the development of a project design and will be very useful in the next steps.
- If participants get stuck, support them with simple questions.
- An adaptation project can comprise several measures. For simplicity, however, it is advisable to let the participants choose one identified measure for which they will carry out the next steps of this session (in the best case, this measure has scored best in the rough assessment in session 4.2). Afterwards, the session can be replicated for other measure options. There are measures that complement each other very well and required by many funding institutions to combine in one project, such as grey measures (e.g. managed aquifer recharge system) and soft measures (e.g. capacity building).

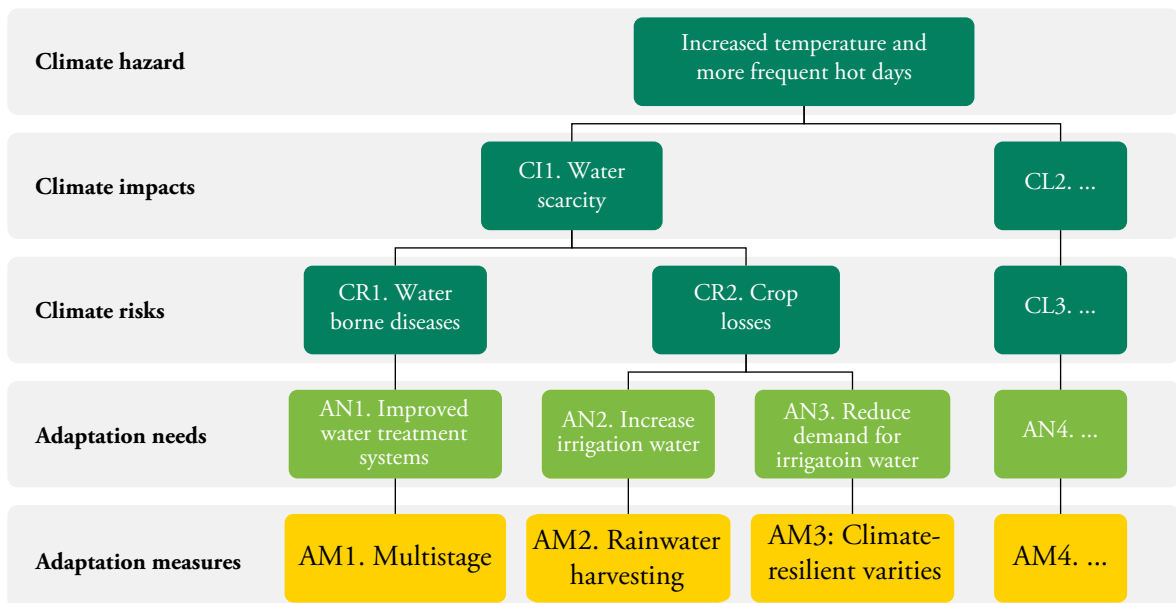
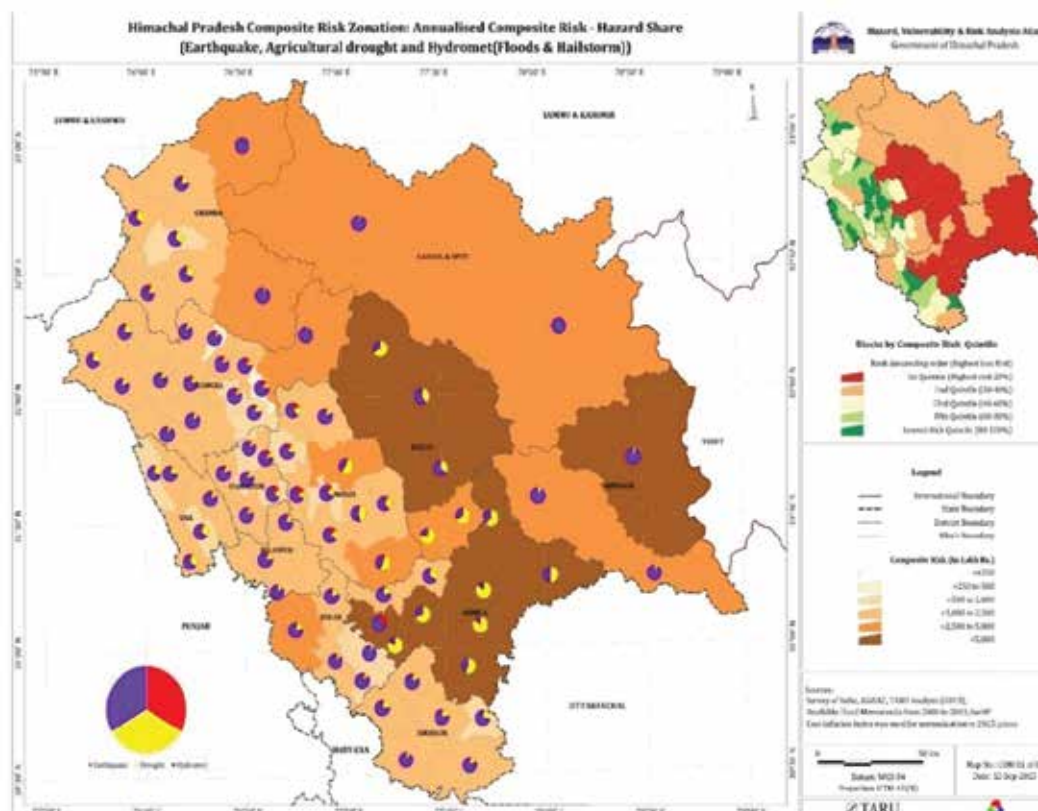


Figure 36 Risk map for HP



Source: HPSDMA, GoHP (2015) Hazard Risk and Vulnerability Map, HP

## Step 2. Developing a basic project design for selected CCA measures (Objectives, Outcome, Output)

This step will guide the participants in defining specific objectives, outcomes and outputs for their selected adaptation measure in Module 4.

### Input presentation: Results chain of an adaptation project

- Present slides 7-12 (presentation 5.1: design a project for selected adaptation measures) to the participants.

A results chain shows the targeted short-, medium- and long-term results of an action in a series of causal statements. As shown in Figure 37, there are four basic components of a results chain:

**Activity:** how the project through proposed measures intends to achieve its objectives and goals.

*Examples:*

- Rainwater harvesting
- Climate resilient varieties

**Output:** the tangible and intangible products that result from project activities often described as direct results

*Examples:*

- $1.1 \times m^3$  of rainwater harvested
- $1.2 \times ha$  area additionally irrigated
- $2.1 \times ha$  field is planted with climate resilient plants

**Outcome:** The short- and medium-term effects of an intervention's output. The outcome describes the **objectives** (what the project intends to accomplish).

*Examples:*

- *To increase year-round access to food to 50% of the vulnerable households through climate resilient cropping practices and water management in three years.*

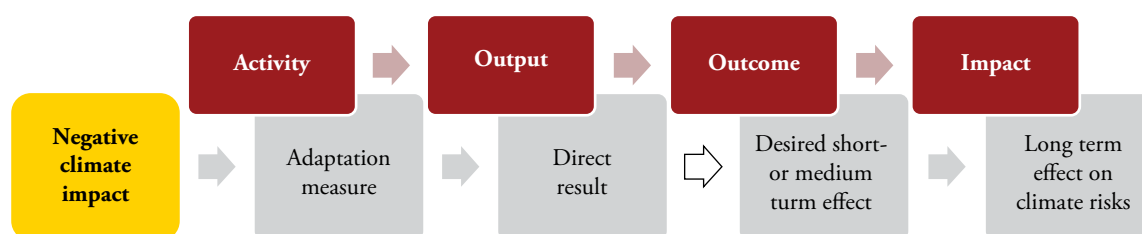
**Impacts:** Higher level strategic goal such as increased access to justice or improvements in public safety. The impact cannot be achieved directly, but only indirectly through the outcomes (objectives) of the project.

*Example:*

- *Achievement of food security in our villages addressing climate change.*

Results chains help to break down and refine your project idea and assumptions for achieving the objectives, and thus form the basis for developing the project action plan (Step 3) and the monitoring and evaluation plan (Session 7.2), that measures the effectiveness of your actions.

**Figure 37.** Results chain of an adaptation project



The SMART concept for defining project objectives and goal (slide 10)

When defining your results chain, make sure that the outputs, outcomes are SMART:

- **specific** – an objective should say exactly what will be achieved, with who, how, when and where;
- **measurable** – so you are able to tell exactly when the objective is achieved;
- **achievable** – it must be realistic given the prevailing circumstances and challenges that you are facing and resources available with you
- **relevant** – it must relate to the problem being addressed; and
- **time-bound** – it must be achieved by a certain date

### **Group exercise: Developing a basic project design (slide 11)**

**Time: 30 min**

- Facilitate the participants in creating their project design. This will be done by continuing their climate impact chain (review exercise) with a result chain. The participants may follow the listed steps:
  1. Start with your selected adaptation measure (green cards from review exercise)
  2. Determine the tangible and intangible products / direct results that result from the adaptation measure, which will be the outputs of your project.
  3. Determine the short- and medium-term effects / benefits of an intervention's output, which will be the outcome of your project. Guiding questions: What does the project intend to accomplish in short-/medium-term?

4. Determine the impact of your project / CCA intervention, which will be the goal.  
Guiding question: If I reduce the climate risks addressed with the selected adaptation measure(s), what are the long-term effects for your village

In case the participants have problems defining the overall goal of their projects, conduct the following visioning exercise with them:

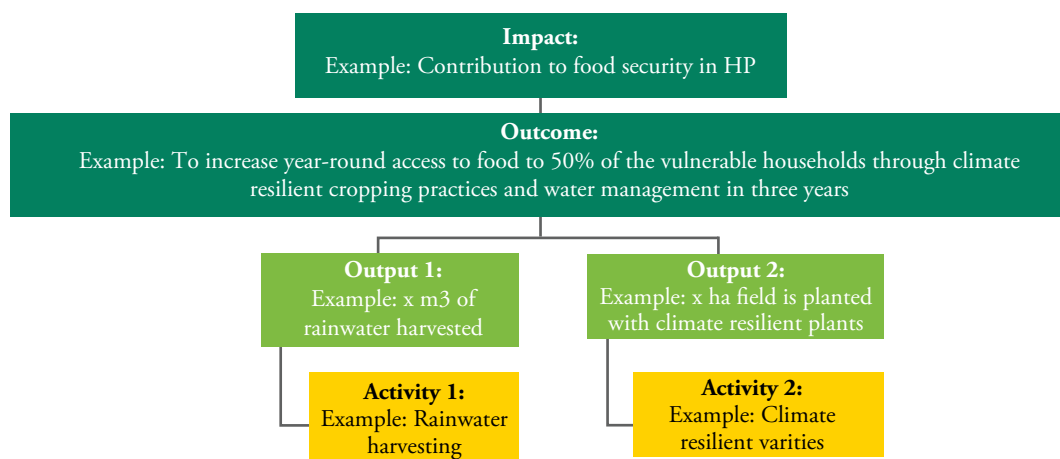
Ask participants to sit back in a comfortable position, relax, and imagine the following:

“It is now one or two years into the future. You and your community are having an enormous celebration to commemorate the project you have finished. The community has really moved forward and you are all beaming with pride about what you have accomplished. You feel excited about some of the obstacles and conflicts you were able to overcome, and you’re all pleasantly surprised to have seen such strong commitment from so many people. You’ve even managed to get good support from outside the community. It’s mid-afternoon and one of the community leaders’ steps to a microphone to recount the major accomplishments and point out the results of your hard work. Listen closely...What do you hear the leader saying? Look around you...What do you see has happened as a result of this project?” (peace corps 2003)

- Engage the participants to write a brief statement or draw a picture with key words to represent their vision/goal they had in mind, when listening to you. Afterwards ask them to present in one minute what they have seen.
- To collect their results, participants can use worksheet 2 of handout 5.1

#### Hint for the trainer

- Advise the participants that the impact generally is really broad and a project just can contribute.
- One activity can have more than one output.
- To give the participants a better understanding of the exercise, it is advisable to present them with an example. You will find one example below in the visualization



### Step 3a. Developing a generic action plan (tasks, roles, timeline, costs)

Action plan is and its respective components: Tasks, schedule and costs. The learning is then applied to the participants’ project ideas/own examples.

#### Input presentation

- Present slides 13-17 (presentation 5.1: designing a project for selected adaptation measures) to the participants.

## Action plan

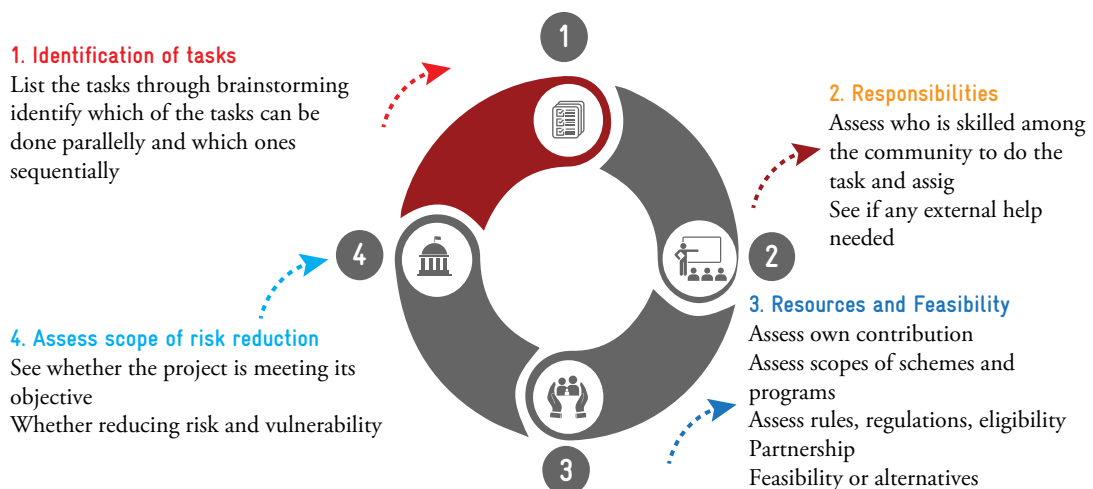
The action plan (sometimes also called project plan) is a logical series of tasks/activities with the aim of achieving the project objectives. Guiding questions: What activities are needed to set up a rainwater harvesting system in my village? (e.g. Are people of my village with required professional skills available? What infrastructure activities are necessary? etc.)

WHAT IS A PROJECT PLAN	WHY WE PLAN	HOW IT HELPS
<ul style="list-style-type: none"><li>A series of steps arranged in specific sequences (one after another or parallel) to lead to an objective that helps in reducing risk or vulnerability of a community</li></ul>	<ul style="list-style-type: none"><li>It is based on issues and priorities</li><li>It clarifies goals and helps community develop a vision or an outcome</li><li>Assess various alternatives and their feasibility</li><li>Assign resources</li><li>Assess partnership/convergence</li><li>Check whether it is reducing risks/vulnerability</li></ul>	<ul style="list-style-type: none"><li>Eliminates poor planning</li><li>Tries to filter out very ambitious projects</li><li>Clarifies linkages of activities to address/issues and problems</li><li>Optimisation of resources</li><li>Better accountability</li><li>Leading to risk reduction</li></ul>

## Steps in action planning

- The facilitator will explain the different steps of action planning by introducing the planning cycle (slide 15) to the participants.

Figure 38. Steps in action planning



Source: CTRAN

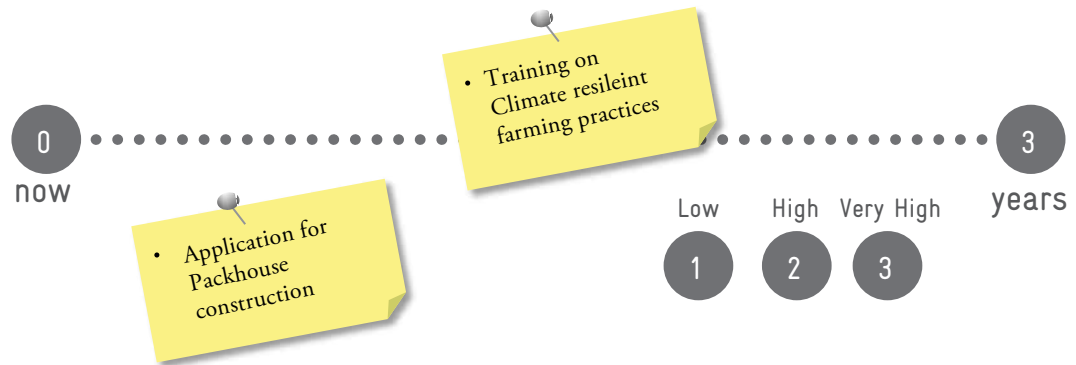
## Group exercise

### Identification of sub-activities and their phasing (slide 16)

- After the participants have identified the climate impact chain and results chain of the envisaged adaptation measure, encourage them to:
  - Brainstorm about various sub-activities that address the prioritised climate risks and help in the achievement of the targeted outcomes.
  - Note them on cue cards and pin them on a timeline. Some in sequence and some parallel (above and below the line).
  - Participants can collect their result on worksheet 3 of handout 5.3

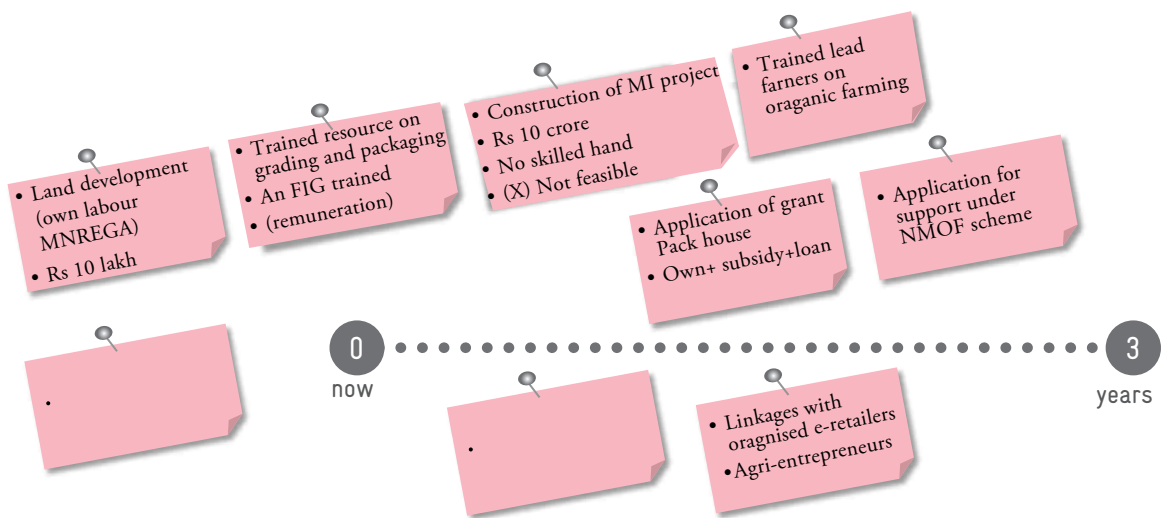
**Examples of sub-activities:**

- Land development
- Formation of Farmer Interest Groups
- Formation of FPO
- Training on Climate resilient farming practices
- Undertaking a MI project by all villagers
- Training on grading and packaging
- Linkages with organised e-retailers
- Application for Packhouse construction
- Training on Climate resilient farming practices



**Estimate resources: Human resources and costs (slide 17)**

- Now, engage the participants to estimate necessary resources for project implementation and operation. **Guiding questions:** Who can lead this activity? Do we have the necessary resources in our community or do we need to hire or partner (Human Resource)?
- Afterwards, ask the participants to have some rough estimate of cost for each activity. Guiding questions: How much of the estimated costs can be contributed by the community? How much budget could be obtained via schemes? What is the gap? What could be borrowed? If the costs are too high, they have to consider alternatives and/or drop the activity unless the objective is at risk.
- Participants can collect their result on worksheet 4 of handout 5.3.



## Develop an action plan

The participants may also use the matrix below to collect their results from the Step 3 exercises and to create an action plan (worksheet 1 of handout 5.3).

- Note the potential activities which the participants identified and will get them to achieve that objective and put these in the left-hand column.
- Ask the participants to identify and to note:
  - Who should lead this initiative (can be individual alone, group, institution)
  - When the activity should be done (immediate: within 2-3 months; soon (in a years' time; later (within 1-2 years).
- In the final step, ask the participants to note the estimated resources needed (They may not get to the number at this stage, let the participants only identify labour, material and indicative cost).
- Participants can collect their result on worksheet 5 of handout 5.3

Activity		1. Land development	2. Farm pond	3. Drip irrigation
Who will do	Individual			×
	group	×	×	
	Institution	PRRD	PRRD	Horticulture
When	Immediate			
	Soon			
	Later			
Resources	Labour			
	Material			
	Financial			

### Step 3b. Specific processes for development of village level action plan (sectoral) that goes into the GPDP

- Present slides 18-23 (presentation 5.1: designing a project for selected adaptation measures) to the participants.

This Step will guide PRI-members in developing a village level action plan under GPDP. To illustrate the theory, a case study example on increasing drinking water availability in your village is given.

Gram Sabha is the critical institution in the planning process.

- It determines the order of priority of works in the meetings of the Gram Sabha keeping in view potential of the local area, its needs, local resources (Para 4 (2), Schedule I)
- Monitor the execution of works within the GP.
- It is the primary forum for conduct of social audits.
- It provides a platform to all residents to seek and obtain all relevant information from all the Implementing Agencies including GP in relation to MGNREGA works implemented in the GP area.

### Case study

The FC-XV in its interim report has recommended a sum of Rs 60,750 crore to PRIs for the year 2020-21. All the tiers in the Panchayats – village, block and district including 5th and 6th schedule



areas shall receive the grants. This will enable pooling of resources across villages and blocks to create durable community assets and improve their functionality. The goal with regard to drinking water is long-term sustainability of water supply system to provide minimum service level of **55 litre per person per day of potable water on regular basis** and PRIs should accord utmost priority to this activity.

**Situation analysis on context:** Your area (reflect on the map) is having moisture stress and drinking water crisis. Women of the village struggle to get water. The tap connections go dry and 3-4 months every year, there is crisis every year for drinking water, water for livestock and crops. The Gram Sabha has debated on these aspects. You can submit a new scheme for drinking water for your village or suggest retrofitting to an existing scheme. How to know whether you have functional tap connection or not?

### These steps will guide you.

How to know whether you have functional tap connection or not?

	Fully-functional	Partially-functional	Non-functional
Quantity	>=55 lpcd	>40 lpcd <55 lpcd	>40 lpcd
Quality	Poatble	Potable	Non potable
Regularity*	12 months or daily basis	9-12 months < daily basis	<9 months < daily basis

### Activities that need to be planned:

#### Community led activities

- Environment creation for a participatory planning/**visioning** exercise (usually starts on 2nd October)
- The I&PH Department should take the pro-active step in contacting **key stakeholders** in the GP, Sarpanch and other functionaries seeking their cooperation and support **to form VWSC and GPPF Team in order to conduct the GPDP exercise.**
- The I&PH Department should identify nodal officers of other schemes (e.g. SBM-G; MGNREGS, WED-PMKSY etc.) requesting their participation and support. These are required for **convergence.**
- **Panchayat Resolution** for taking it as part of Jal Jeevan Mission (JJM) in the GP. This may differ for other sectoral action plans.
- Orientation to the VWSC and local members of GPPFT on GPDP, and the significance of VAP for enhancing rural water supply especially the situation getting aggravated due to climate change
- **Analysis of the Situation Analysis Report through PRA**, Household Survey and collecting data available with other secondary sources such as Panchayat Office.
- **Identifying gaps** in service level and infrastructure / facility requirements
- Preparing a **Draft Status Report (DSR) / along with Rough Cost Estimate (RCE)**

#### Official Facilitation with PRIs

- Presentation of DSR and RCE in the Panchayat Development Seminar at GP
- Identifying Resource Envelop from various Schemes (based on the cost norms)
- Aligning VAP with existing schemes (convergence planning)
- Preparing an indicative Perspective Plan and Realistic Operational Plan
- Finalising the WS-VAP that forms part of the overall GPDP
- Approval of JJM part of the VAP by the Gram Sabha / by the PHED / RWS Dept.
- Report at IMIS of DDWS


- Preparation and finalisation of design, estimates and technical approval as per existing departmental procedures.
- Determination of community contribution and deposit in the bank account
- Award of work and issue of contract, as per departmental procedures

## Group exercise

### Visioning exercise

Participants can build a vision of their village on water related aspirations so that they develop their adaptation project with a clear objective and timeline (SMART criteria).

Step 3b. Processes for village level action plan



15 min, worksheet 6

## Visioning exercise

Focus on the water supply in your village. If a water transect is available, use it. Focus on short-term (3-5 years) and long-term (>5 and around mid-century) measures.

NOW - N (within one year)	SOON - S (within three years)	LATER - L (within five years)
<ul style="list-style-type: none"> <li>• 100% FHTCs coverage within one year.</li> <li>• The toilets in the primary school and anganwadi be rendered usable with water line facility.</li> <li>• Renovate all ponds, and water storage structures in the village.</li> <li>• The GP empowers a list of agencies to attend to preventive / breakdown maintenance.</li> <li>• All the households pay water tariff as prescribed.</li> <li>• IoT-based sensor set up so as to send water wastage/ overflow from OHT/ESR.</li> </ul>	<ul style="list-style-type: none"> <li>• Survey and count HH without drinking water tap connection / those with illegal water tap connection and those who use motors for sucking water from pipeline.</li> <li>• Regularize unapproved tap connection &amp; remove water taps where pumps are used for sucking water from water distribution lines.</li> <li>• Power pump operators are trained in preventive maintenance, and minor break down maintenance.</li> <li>• Periodical water quality test in place.</li> </ul>	<ul style="list-style-type: none"> <li>• All office / school buildings and premises to have roof-water harvesting structures.</li> <li>• Every farm to have a farm pond for water storage.</li> <li>• Groundwater recharge pits be made in 20 strategic points in the village.</li> <li>• 1000 tree saplings be planted in common &amp; private lands.</li> <li>• Ensure all the public institutions have safe water supply facility, and ensure that the wastewater disposal made scientific.</li> </ul>

Create problem and solution cards for each of the boxes.


Key problem areas (e.g.)

- Acceptance
- Funds
- Skills
- O&M issues

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- Ask the participants to identify what they want to see immediately and what they want to see in their village after 5 years.
- You can add elements to each of the boxes as per the opinion of the participants
- You can ask various problems likely and classify them under key problem areas

Step 3b. Processes for village level action plan



15 min, worksheet 7

## Solution cards

Focus on possible solutions and prioritise them according to the matrix below

	Solution - 1 (Renovate just enough to provide additional FHTCs – and the GP will take up O & M)	Solution - 2 (Join in a feasible MVS, and provide FHTCs – the GP will do O & M)	Solution - 3 (Renovate completely as full-fledged SVS& provide FHTCs – GP will do O & M)	Solution - 4 (Renovate completely as full-fledged SVS, contract it out to Private operators for O&M)	Remarks
Criteria -1 (Community Acceptance)	3	2	4	1	
Criteria -2 (Technical easiness to use and operate)	3	3	4	3	
Criteria -3 (Fund support from scheme / HH)	4	3	4	2	
Criteria -4 (Maintenance)	3	3	3	4	
Score	13	11	15	10	
Rank	II	III	I	IV	

Solution cards can be ranked as follows

- ○ ○ ○ Most preferred
- ○ ○ Moderately preferred
- ○ Slightly preferred
- Least preferred

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- You can ask participants to vote and put round cards to each solution. This needs to be totalled up as shown above and ranked.
- Participants can collect their results on worksheet 6&7 of handout 5.3.

## Resource Convergence

The Village action plan is a convergent plan and resource envelope can be calculated based on funding mechanisms of different schemes. This has to be worked out to decide, which CCA work can be undertaken.

## Resource Convergence

Combine resources from different schemes\* to be able to carry the total resources for the implementation of the action plan.

S.No.	Issues in Question	Ministry / Department concerned		
1.	Drinking Water Piped water supply for every household Water supply to all the HHs Pipe-line extension for covering uncovered households Creation of new Over Head Tank, Pump Room Renovation of water supply infrastructure Drainage systems Water quality surveillance / Testing Labs Addressing water quality problems Rain water harvesting Water for school toilets, water for GP office, water for Health Centre	Ministry of Jal Sakthi Department of Drinking Water and Sanitation Jal Jeevan Mission (JJM) Dept Rural Water Supply Water Quality Labs, District / Block Water and Sanitation Mission	3.	Water Conservation Water conservation, water storage structures, watershed, pond renovation, rainwater drainage, PMAY - Housing for all
	4.		SKILL Training for water supply Maintenance Training of Power Pump Operators Training hand pump mechanics Training in water treatment, purification methods, chlorination	
	5.		Capacity Building of Panchayats and orientation to Panchayat functionaries Orientation on rural water supply management, and VWSOC by law Local governance of water supply (with a special emphasis on financial management) Local governance of water supply (with a special emphasis on O & M)	
2.	Sanitation Centralised wastewater treatment system Household level wastewater treatment system	Swachh Bharat Mission (Urbani) District SBM-G office Block SBM-G office		Department of Rural Devt. (MGNREGS) Department of Rural Development (Block Devt. Office) Ministry of Skill Development & Entrepreneurship (State / District level Skill Development Mission) RUDS/ETIs
				Ministry of Skill Development & Entrepreneurship DDU-GKY SRDIs NRCDs/FR

\* Detailed of the schemes and the application process has been discussed in module 5.6

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## Step 4. Database generation for adaptation planning

### Input presentation

- Present slides 23-33 (presentation 5.1: designing a project for selected adaptation measures) to the participants.

Both primary and secondary sources are needed for generating databases for planning purpose. While secondary data sets are available from official records, websites and research studies; the primary data is usually generated through survey and PRA techniques.

#### Primary source

Household Survey  
PRA (Transect Walk, Social Map, Resource Map, Seasonality Analysis, Problem Analysis)

#### Secondary source

Panchayat office records, Block Development Office records, Government web portals (e.g. Gram Swaraj, Mission Antyodaya, jalshakti-dws.gov.in, sbm.gov.in, CGWB, soil health card, water quality data from labs)

The following slides give an overview of types of data needed for CCA planning in water and agriculture sectors and where to find them and how to track them in a planning cycle

## Database generation: for water and agriculture (VWSP, and CRA)

The following types of data need to be generated for a climate-resilient planning process in the water and agriculture sector.

Category	Key data
Demographic	Population (M, F, Child, Old & Infirm), Household type (Poverty, SC-ST, Female headed), Literacy level
Socio-economic profile	Occupation (Cultivator, agri-labour, artisan, etc.), Govt employee, MGNREGA job card holders
Land holding and Land use patterns	Small and marginal farmers, large farmers, etc. Area under cultivation, forest, fallow, irrigation, etc.)
Agriculture	Crops (season wise are, production, area under irrigation (season-wise)
Water	Sources of water (canal, springs, ponds) by devices, functionality (drinking water sources, use and level of functionality in different seasons), water quality data
Institutions	Social organisations (SHGs, VWSCs, Coops, FPOs, CBOs, etc), Power supply, Banks & MFIs, Health and education facilities, anganwadi workers, mahila mandals, etc.

Detail formats are in handout

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The data mentioned above can be obtained from the following sources in the entire project cycle for a drinking water project. Details are in the handout.

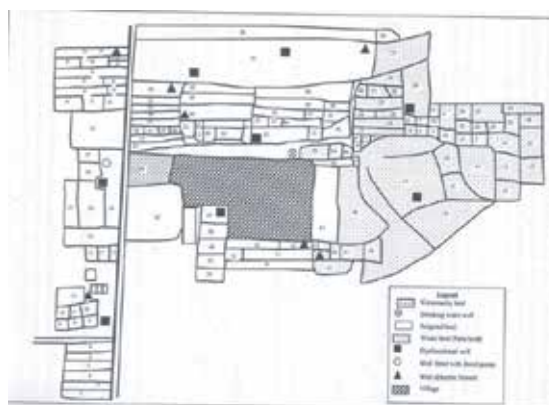
Category of data	Sources where it can be found
Secondary data	Listing of areas for which data is required (Depending upon focus areas of GDPD identified by the State) for example, health, education, drinking water, and any specific local issues identified by the Panchayat Committee.  District handbook, district census handbook, economic census, district plans, Data on water and sanitation, data that is available in records of GP (make sure that this data is updated); PHC/sub-centre level data; PDS data; Data in Anganwadis; Data in Primary School; SHG/ SHG federation data, FPO and FIG data, etc. SBM survey data. Water quality data from labs.
Primary data	Survey, social and resource map, timeline and seasonality analysis (e.g. water, disease incidence, migration), hazard line analysis, sectoral transect (e.g. water, agriculture, etc.).
	Measured data if recorded (rain gauge, groundwater, pollution or waste)

Source: WSP

### Example: Water Budgeting is a critical step for Village Water Security Planning

The process of water budgeting that leads to VWSP has been shown in the following slides.

## Thematic Maps for resource mapping and water security planning



Thematic resource map, water transect

Facility / Source	Winter			Summer			Monsoon			Autumn		
	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.
Type of point Source (Locations)	Highly dependable	Partially Dependable	Un dependable	Highly dependable	Partially Dependable	Un dependable	Highly dependable	Partially Dependable	Un dependable	Highly Dependable	Partially Dependable	Un dependable
Type of pumping Source (Locations)	Highly dependable	Partially Dependable	Un dependable	Highly dependable	Partially Dependable	Un dependable	Highly dependable	Partially Dependable	Un dependable	Highly Dependable	Partially Dependable	Un dependable



Seasonality analysis, source sustainability

## Water Budgeting



30 min, worksheet 8

After gathering information on the sources and water supply infrastructure, the VWSC and the planning team will use the information to prepare their village plan and integration into Gram Panchayat Development Plan.

A **water budget** is prepared by estimating how much water is available from the surface, ground sources and rainwater harvesting and comparing this with how much water the users require. This should be done for summer and winter. Communities should use a combination of rainwater harvesting, groundwater and surface water sources so as to provide the best value for money at different times of the season.

Type of Source	Summer			Winter		
	Water available (supply)	Water used (demand)	Gap	Water available (supply)	Water used (demand)	Gap
Rainwater • Source 1 • Source 2 • ...						
Groundwater • Source 1 • Source 2 • ...						
Surface water • Source 1 • Source 2 • ...						

Based on the gaps between demand and supply, various sources are augmented, role and responsibilities are assigned. Different schemes such as MNREGA, PMKSY, IWMP, etc, are converged. Communities too contribute certain %ages. This plan once approved by gram sabha is termed as **Village Water Security Plan (VWSP)**.

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### Useful literature and databases

- People's Plan Campaign for Gram Panchayat Development Plan (Gpdp) 2021-22. [https://gpdp.nic.in/resources/PPC-2020\\_Booklet.pdf](https://gpdp.nic.in/resources/PPC-2020_Booklet.pdf)
- Department of Drinking Water and Sanitation, Ministry Of Jal Shakti: Jal Jeevan Mission Presentations. Available at: <https://jalshakti-ddws.gov.in/presentations-water>
- Government of India, Ministry of Rural Development: The Mahatma Ganhi National Rural Employment Guarantee Act 2005. <https://nrega.nic.in/Netnrega/stHome.aspx> and various circulars
- HPSDMA, GoHP (2015) Hazard Risk and Vulnerability Map, HP
- Government of India, Ministry of Drinking Water and Sanitation and Water and Sanitation Program (2015): Toolkit for the Preparation of a Drinking Water Security Plan. <https://www.wsp.org/sites/wsp/files/publications/WSP-India-Toolkit-for-Preparation-of-Drinking-Water-Security-Plan.pdf>

### Key take-aways

- The generic project planning concepts are an essential step in designing specific sectoral projects.
- When designing a project following concepts should be considered: SMART for objective setting, logical frameworks from input to outcome and also participatory techniques like visioning, resource transect, problem analysis and solution techniques.

### Debriefing questions

- What are your important take-aways/ messages from this case study?
- Which part of the exercise do you find most relevant for your work?
- Do you know how to apply the key concepts to your work?
- Did the session help you to design and plan your adaptation project?

## Session 5.4 Using simple spatial techniques for NRM planning

<b>Learning objective</b>	To use simple spatial techniques for NRM planning	
<b>Prerequisites / prior knowledge for successful participation</b>	Prior knowledge/skill of computer (handling data/MIS/GIS) is essential	
<b>Steps (duration)</b>	<b>Step 1.</b> Creation of village boundary on Google Earth Pro	20 min
	<b>Step 2.</b> Uploading boundary in Bhuvan and collecting thematic layers	20 min
	<b>Step 3.</b> Generating contours using QGIS	20 min
<b>Total duration</b>	60 min	
<b>Methods/Exercises</b>	Creating a map with Google Earth Pro for NRM planning on village level	
<b>Material</b>	PowerPoint presentation 5.4, handout 5.4, Laptop, LCD projectr, internet connection, Google EarthPro, QGIS installed and registration with Bhuvan portal (this has to be taken up by trained instructors prior to the training session), videos	

### Step-by-step approach

Increasingly, geo-spatial techniques are being used for NRM planning in the villages. This is being used to enhance transparency and accountability. Most of the assets are geo-tagged and it provides scope to assess gaps and their monitoring on a real time basis. **Step 1** focuses on the use and creation of maps in Google Earth Pro, using village boundaries as an example. **Step 2** continues with the case study example and introduces participants to the use of thematic layers in the Bhuvan Portal. Contours are useful to understand the topography of the selected area. They can also be used to calculate the storage capacity of a reservoir when an earthen dam is constructed. For how to do this with QGIS, see **Step 3** on Digital Elevation Model (DEM).

#### Hint for the trainer:

- The trainer can start with this video and explain it with the PPT and worked out lab
- Video: <https://www.youtube.com/watch?v=g-jAa4a7tzc>

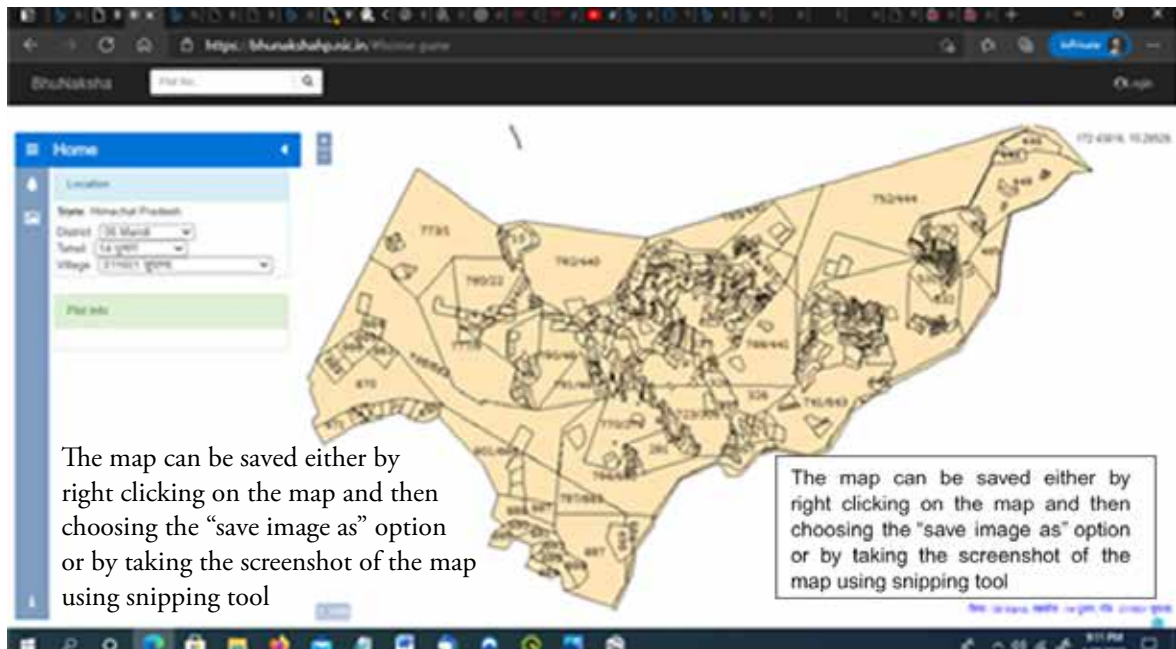
### Step 1. Creation of village boundary on Google Earth Pro

- Present slides 3-5 (presentation 5.4 – Geospatial technology for NRM) to the participants.

The village boundaries are available on cadastral maps that are with the Revenue Department i.e. with the Patwari of the Gram Panchayat. These maps may also be accessed in digitized form from the website of the Department of Land Records. In Himachal Pradesh, this website is <https://bhunakshahp.nic.in/>.

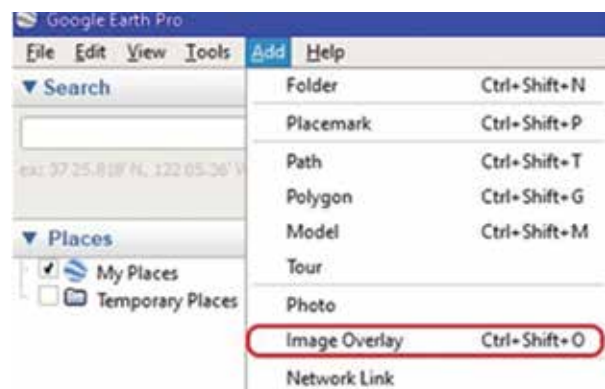
- Log on to the website and search for the selected village. The interface window of the website and resulting village map is shown here. To avail the desired village map, the following steps can be used:
- Open the web browser and log on to <https://bhunakshahp.nic.in/>
- In the left panel, search the village by going to District>Tehsil>RI>Village
- The village map will be displayed in the main window (on right side of the search panel).
- Save the map either as .png or .jpeg format





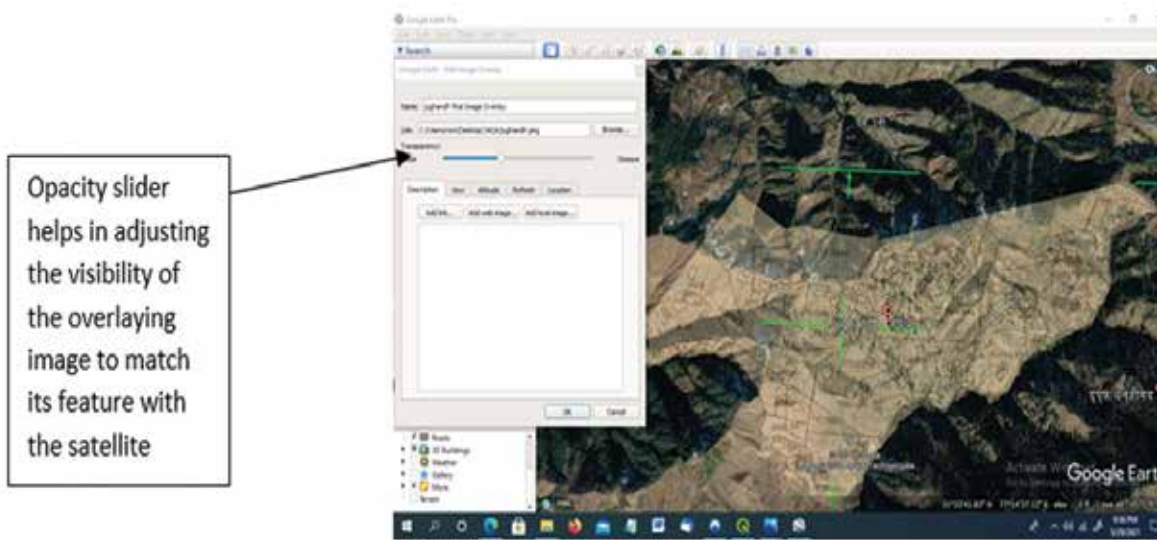
Some information on the cadastral map can be found on the search panel like the ownership of land. The blue coloured fields represent the government or community land and the pink colour represents private land within the village boundary. This information can be used for planning on individual or community land.

To draw the boundary of the village, the next step is to overlay the cadastral (revenue) map with the Google Earth. This is done by trying to match the features like roads, ponds, water bodies or any other benchmark displayed in the cadastral map and Google Earth imagery. Albeit, this is a time taking step, but once done, the subsequent steps become much easier.

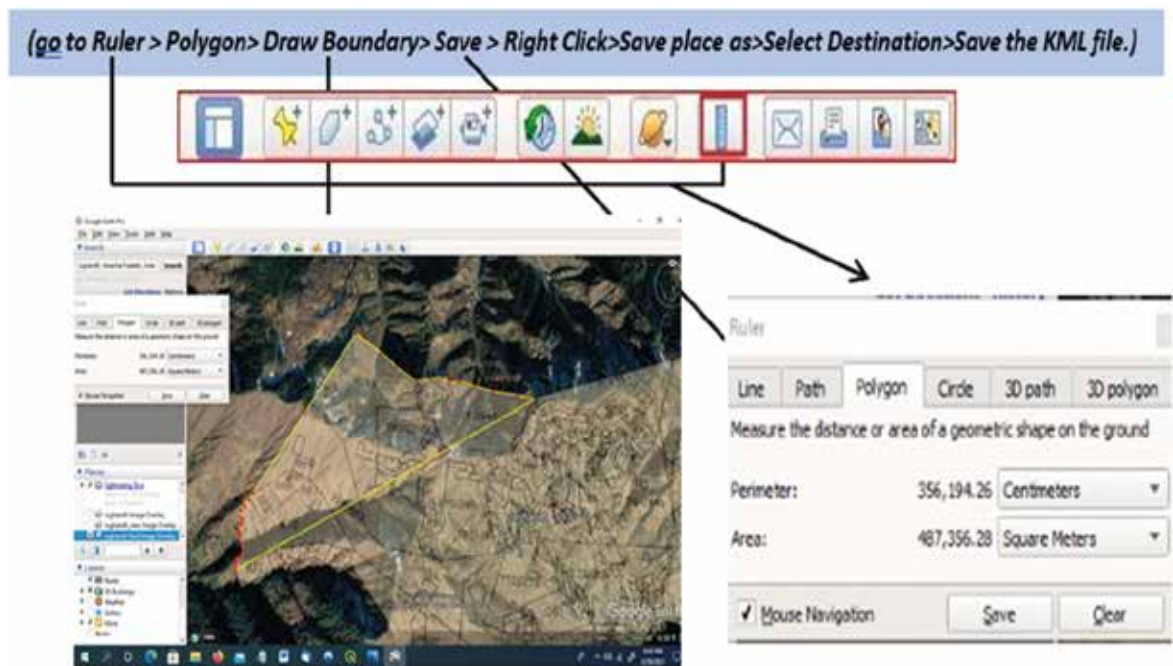


To superimpose the cadastral map on Google Earth imagery, the following steps are to be done.

- Open Google Earth Pro. Ensure that the computer/laptop has an active internet connection.
- Go to “add image overlay”.
- When the dialogue box opens, write the name of the layer (e.g. cadastral map) and then click ‘browse’.
- Browse the location where the cadastral map is saved on the computer/laptop.
- Select the cadastral map and click open.
- Reduce the opacity of the layer by sliding the opacity slider to around 40-50% and try to match the physical features of the map with the Google Earth Pro imagery.



Once the cadastral map is completely overlaid, draw the boundary of the village and save it as .kml file.

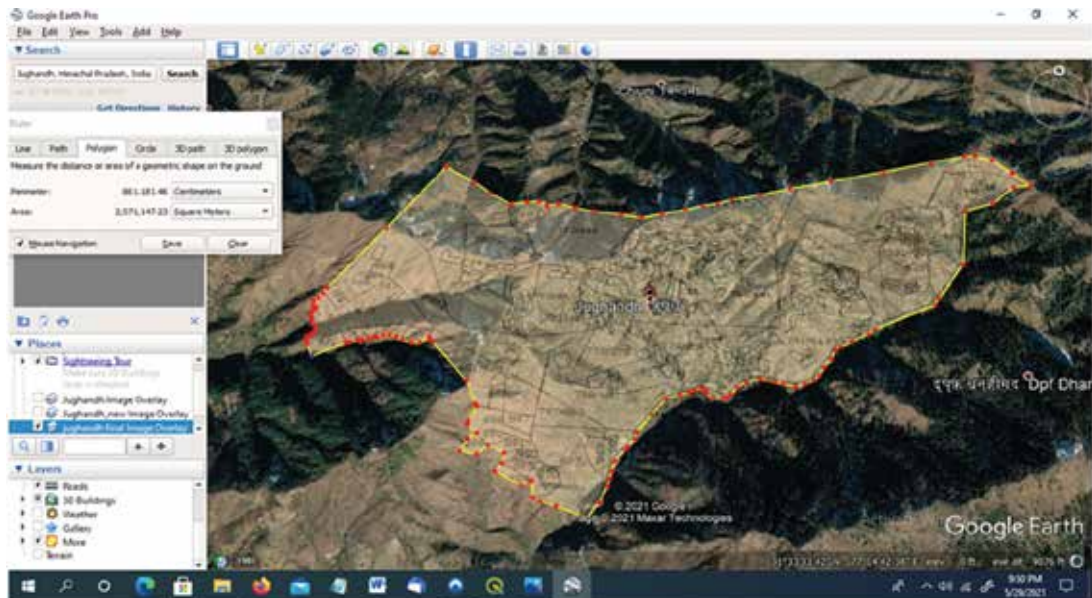


The accuracy of the boundary can be increased by zooming in the map to the maximum extent visible and then clicking on the boundary outline. After the demarcation of the boundary is done, match the enclosed area of the polygon with the actual area of the village available at land record website or with the Patwari. The changes in the area enclosed within the polygon can be done later also, if it does not match with the actual area of the village.

- After drawing the complete boundary of the village, click “save” on the ruler box.
- A new dialogue box will open and will prompt for the name of the layer. Put the name of the village in the name tab.



- From the style and colour tab, change the colour of the boundary line and its thickness.
- Click save.
- The layer will get saved in the left panel with the name put in the name tab. Right click on the boundary
- layer name and select “save place as”.
- Choose the destination folder and select the file type as KML.
- Save the boundary in the desired location in the computer/laptop



Always use bright and visible colour for polygon line which can be visible even in small screen

## Step 2. Uploading boundary in Bhuvan and Collecting Thematic Layers

- Present slides 6-8 (presentation 5.4 – Geospatial technology for NRM) to the participants.

When the village boundary is created in Google Earth Pro and saved in the desired location, same can be uploaded in the Bhuvan portal and different thematic layers can be generated.

The process of generating thematic layers is as follows:

- Open Bhuvan Portal by logging on to [www.bhuvan.nrsc.gov.in](http://www.bhuvan.nrsc.gov.in)



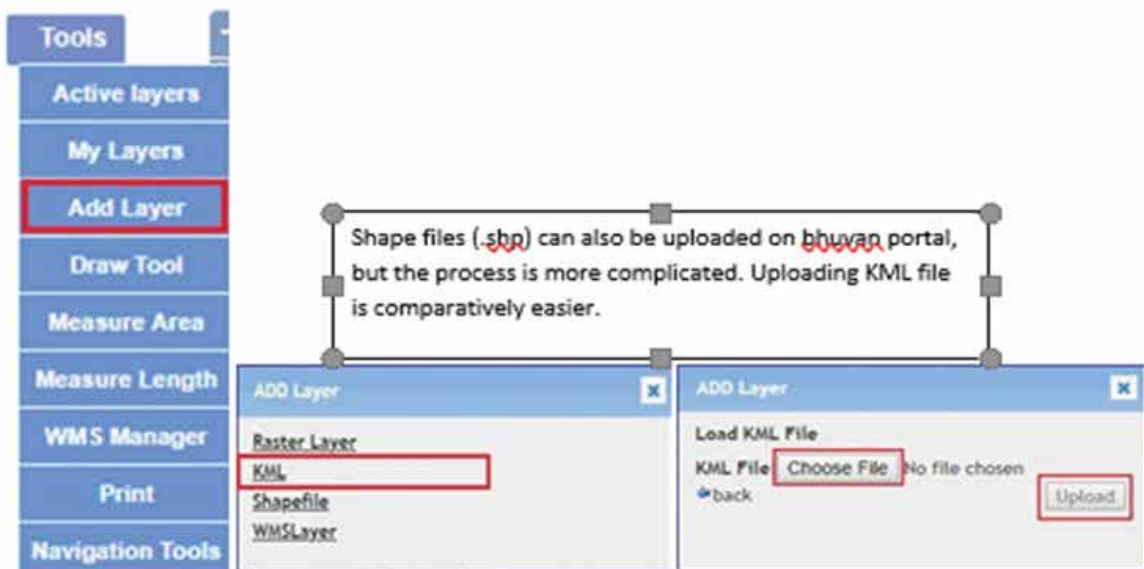
- Select the state from the drop-down list at the right side of the panel (below the map of India).
- Click on the state name and you will be navigated to a different tab where the map of the selected state will open with Bhuvan toolbars.



Go to (Tools > Add Layer > KML> Select File> Upload

- Now you can upload the boundary of the village (kml file) to the Bhuvan page



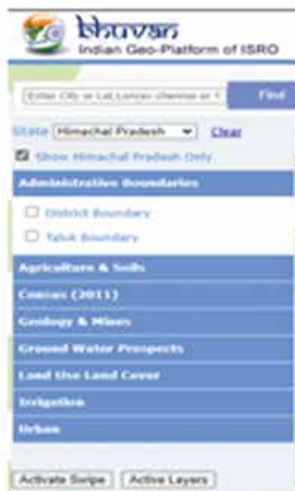


- The village boundary will be uploaded and will be visible in the colour it was saved.
- Zoom in the boundary to visible extent on the screen.

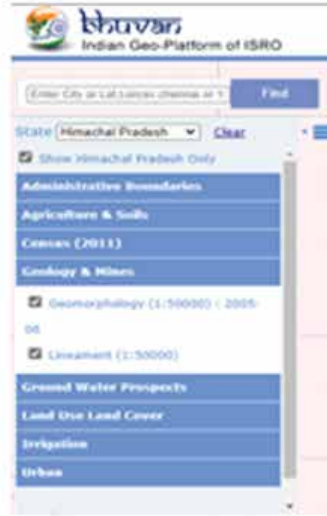
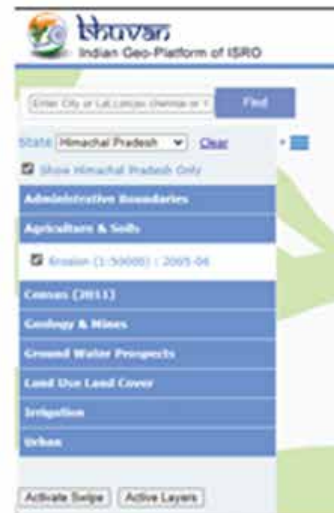


- Now create all thematic layers available at Bhuvan from the left panel of the page. Different layers are available under different tabs which are mentioned below:

Agriculture & Soils	Soil Erosion
Geology and Mines	Geomorphology
	Lineaments
Ground water Prospects	Ground Water Prospects
Land Use Land Cover	Wasteland
	LULC



These layers are available in WMS format also for use in GIS software like QGIS etc. where detailed analysis can be done



To understand the different colours of the thematic layers, a legend tab is available in the bottom left corner of the page. To display the legend, click on the tab and a small box will open which contains all definitions of the colours, symbols within the map.

*A legend is the detail of different colour codes or symbols used in thematic layers. Correct interpretation of the thematic colours/ symbols can be done by understanding the legends on any map.*



All the thematic layers and their legends can be saved on the computer by taking screenshots using the “Snipping Tool” which is a window’s default app. To open the snipping tool, go to search tab in the task bar and search by typing ‘snip’. Since, Snipping Tool is used frequently, it can be pinned to the taskbar and can be used whenever required.

- After all the 6 layers are saved, go to Bhuvan main page and select the Bhuvan 2D tab which will be redirected to a new browser tab with Bhuvan 2D page.



- Repeat the procedure of uploading the kml boundary of the village and zoom in to the full extent of the boundary visibility.

**Go to (Tools > Add Layer > KML > Select File > Upload)**

- Change the map type from **Base Admin** to **Base Hydrology** to display all drainage lines mapped in Bhuvan.
- Take the screenshot of the drainage lines inside the village boundary by using snipping tool and save it to the destination folder.





Now we have 7 thematic layers to be analysed by superimposing them on Google Earth Pro. All these layers can be overlaid on Google Earth Pro and analysed for problem identification like soil erosion problems, wasteland, lineaments etc. Suitable NRM structures can be proposed on appropriate sites based on these bio- physical characteristics. It is an important decision-making tool which guides us in selecting the right work at the right place and not ending up by selecting random NRM works at any place.

Apart from these thematic layers, many other layers are also available in the Bhuvan Portal which can be used as per the requirement of the project.

The next step is to create contour lines using QGIS software.

### Step 3. Generating Contours Using QGIS

- Present slides 9-11 (presentation 5.4 – Geospatial technology for NRM) to the participants.

Contours are useful in understanding the topography of the selected area. They can also be used to calculate the storage capacity of any reservoir if an earthen dam is constructed. Using QGIS, contours of desired intervals can be generated from the Digital Elevation Model (DEM) and used as per the requirement of the project.

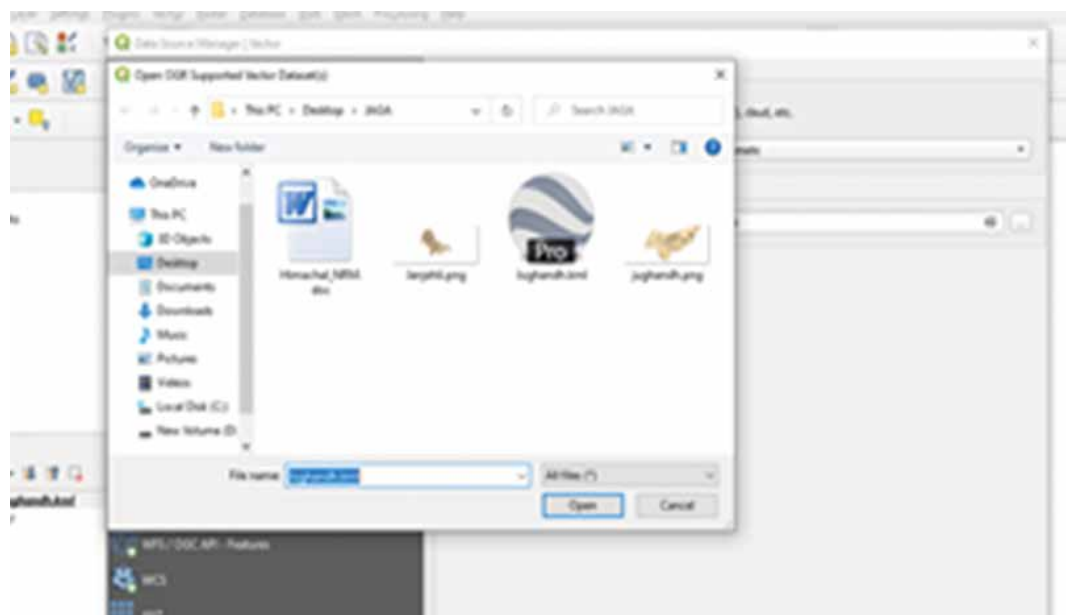
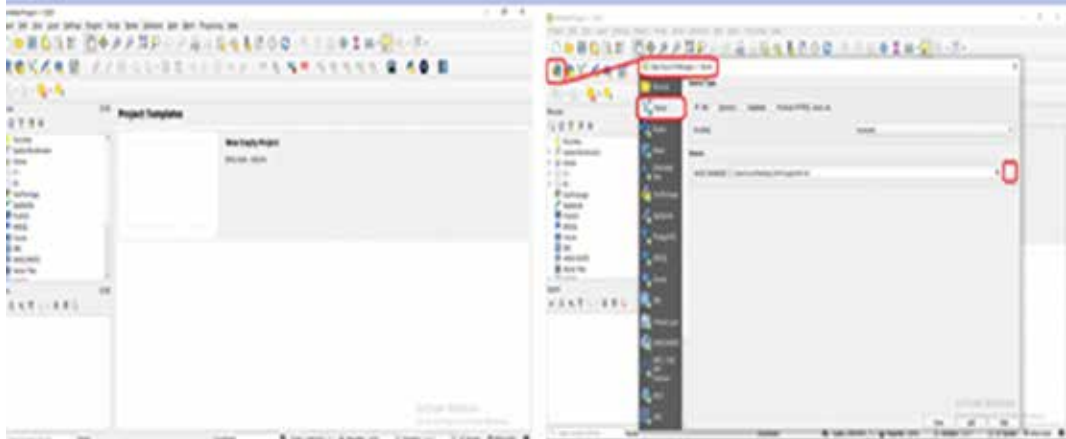
It is recommended to visit the EarthExplorer as your first place to obtain the Digital Elevation Model data. There are many kinds of GIS dataset you can download for free. In order to use the EarthExplorer service, you will need to create an account. It is free. You can visit <https://ers.cr.usgs.gov/> to create a new account and log in to download dataset of your interest. There is also another way to download SRTM DEM directly from QGIS with the help of SRTM downloader plug in.

To generate the contours, the following procedure can be followed,

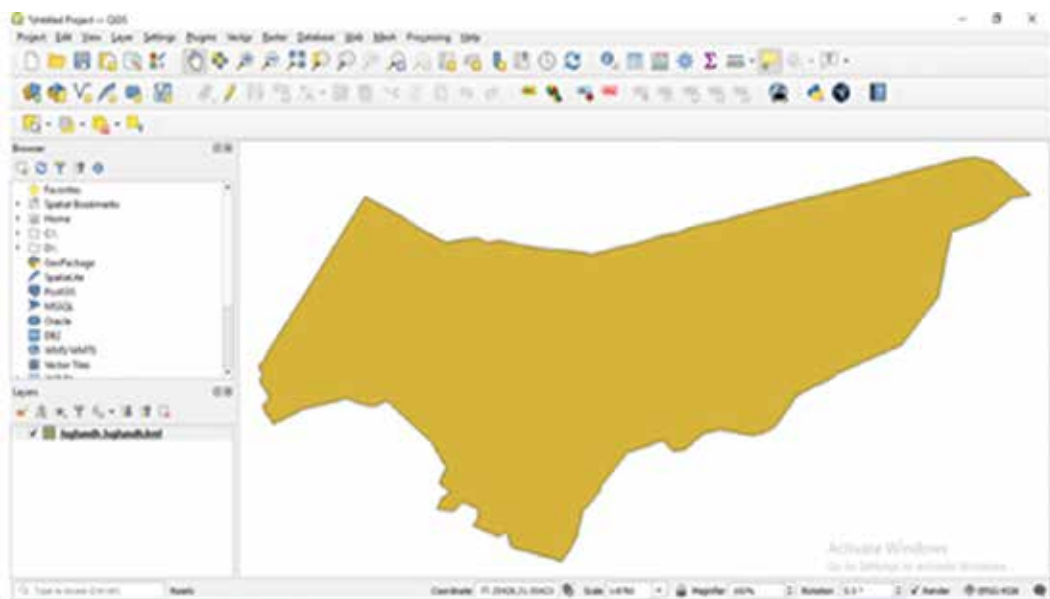
- Open QGIS of any version available to use. This is an open source free software and hence license is not required to use it.
- Ensure that your computer/laptop has an active internet connection while using QGIS as it requires the data to be downloaded.
- When the QGIS opens, upload the boundary of the village which is in .kml file format



click "Data Source Manager">Vector>Select the Folder>Select file>Add



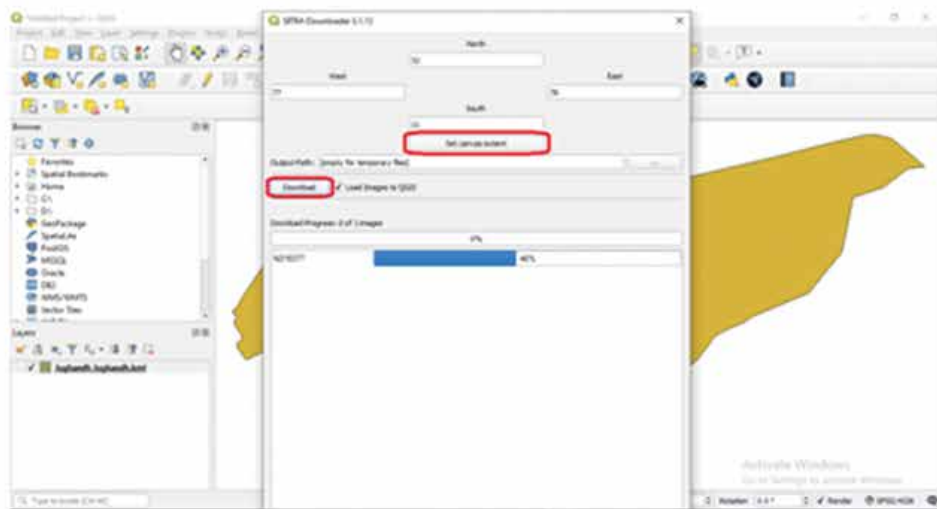
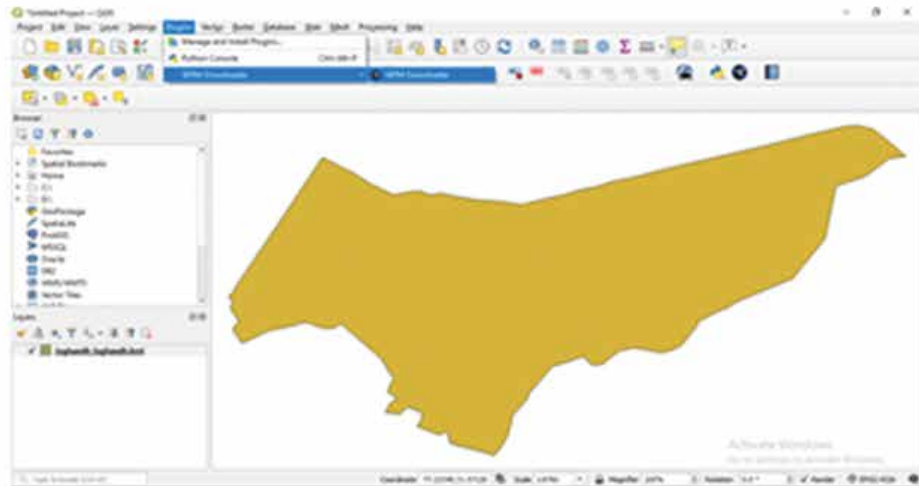
The kml boundary of the village will open in the main page of the QGIS and its layer name will be visible in the layer panel which is to the left of the main window.



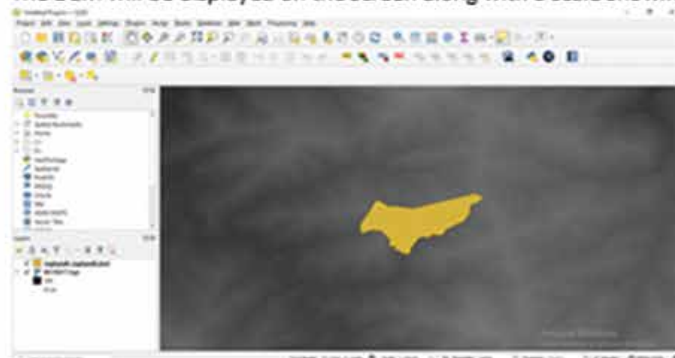
Now, to get the Digital Elevation Model (DEM), follow the procedure as illustrated below:

There is an easier way to download SRTM data on QGIS. With a special plugin, we can easily download the online SRTM data directly from QGIS. This plugin needs to be installed first. The name of the plugin is SRTM downloader.

1. Install SRTM Downloader Plugin
2. Go to Plugins | Manage and Install Plugin. Search for SRTM Downloader
3. Click Install plugin to start the installation. Once the installation completes, there will be a new menu SRTM Downloader under Plugins.
4. To use the plugin, click SRTM Downloader and then specify the extent

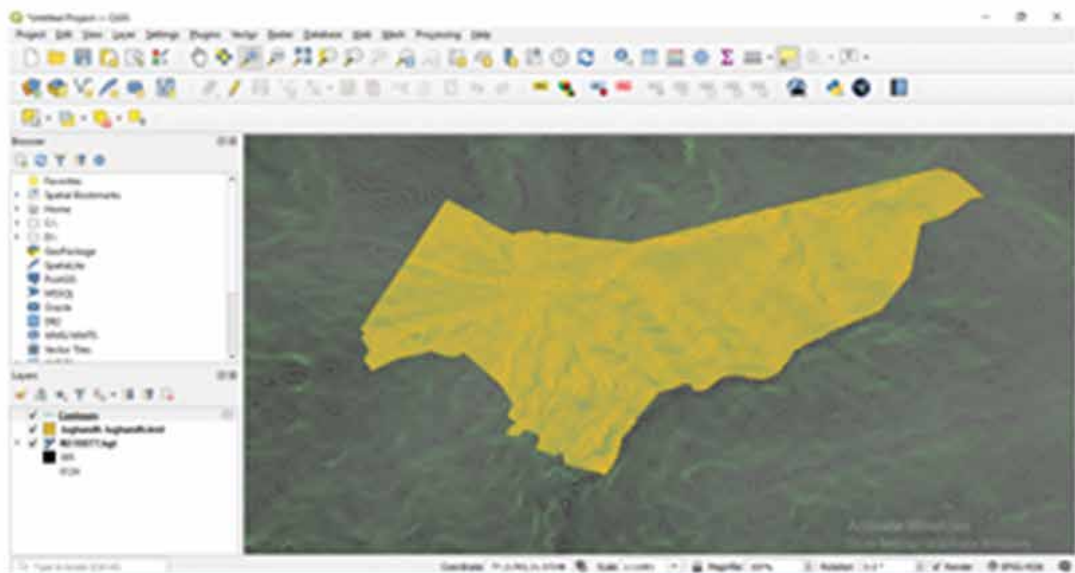


The DEM will be displayed on the screen along with a scale showing the elevation in meters.



Go to Raster | Extraction | Contour. The contour creator window will open up. You will need to specify the following:

- Input layer– This should be your SRTM imagery
- Band number –band1
- Interval between contour– type the contour interval you want to generate
- Attribute name –field name for the elevation data
- Advanced parameters –You can specify the output contour file here. If you leave it blank, QGIS will create a temporary scratch layer.



To save the generated contours as image, take the screenshot using “Snipping Tool”.

To save the generated contours as a vector file, follow the procedure shown below:

Go to Layers Menu>Export Layer(s) to New File> Choose “KML/KMZ (Vector Data Only)>Click OK> Save the contour to the destination folder as KMZ file.

This contour is a georeferenced file and can be imported to Google Earth by double clicking the saved KMZ file.

These contours contain their information like elevation data in meters. The value of the contours can be known by clicking the contour on the Google Earth Pro and the same can be used for different calculation purposes.

By going through the above-mentioned procedures, the GIS based plan for NRM can be made with effective output and outcomes. Appropriate structures can be selected based on the bio-physical analysis and effective NRM structures can be planned.

#### **Hint for the trainer:**

- You can show this video of a case study to further exemplify the content of this session
- Video: <https://www.youtube.com/watch?v=zsrULVnxSdk>

#### **Useful literature and databases**

- People’s Plan Campaign for Gram Panchayat Development Plan (Gpdp) 2021-22. [https://gpdp.nic.in/resources/PPC-2020\\_Booklet.pdf](https://gpdp.nic.in/resources/PPC-2020_Booklet.pdf)
- Stockholm environment institute (2010): Linkages between disaster risk reduction (DRR) and climate change adaptation (CCA). Available at: <https://www.preventionweb.net/publications/view/18241>
- Hare M., et. al. (2013): CATALYST, Capacity Development for Hazard Risk Reduction and Adaptation. Available at: [https://twas.org/sites/default/files/catalyst\\_d65\\_best\\_practices\\_policy\\_notebook.pdf](https://twas.org/sites/default/files/catalyst_d65_best_practices_policy_notebook.pdf)
- Government of Odisha, Panchayat Raj Department (undated) Technical Manual of MGNREGA
- Disaster Management II. Available at: <https://www.drishtiiias.com/to-the-points/paper3/disaster-management-ii>
- Government of India: National disasters response plan. Available at: <https://www.nidm.gov.in/PDF/pubs/NDRP.pdf>
- Department of Drinking Water and Sanitation, Ministry of Jal Shakti: Jal Jeevan Mission Presentations. Available at: <https://jalshakti-ddws.gov.in/presentations-water>
- Government of India, Ministry of Drinking Water and Sanitation and Water and Sanitation Program (2015): Toolkit for the Preparation of a Drinking Water Security Plan. <https://www.wsp.org/sites/wsp/files/publications/WSP-India-Toolkit-for-Preparation-of-Drinking-Water-Security-Plan.pdf>

#### **Key take-aways**

- There is some degree of overlap between GPDP and CCA-DRR and this needs to be clearly articulated
- The tool (in the case-study) encourages participants in thinking through these linkages in the CCA-DRR framework of the country
- The tool encourages participants to fine tune action plans by assessing alternatives
- Focus on addressing how the benefits can accrue to community and individuals both in short run and long run especially during and after disasters



## Debriefing questions

- What are your important take-aways/ messages from this case study?
- Which part of the exercise do you find most relevant for your work?
- Do you know how to apply the key concepts to your work?
- Did the session help you to use the GPDP mechanism to integrate NRM plans to address climate and disaster risk?

## Session 5.5 Adaptation measures that can be leveraged through GPDP/MGNREGA vis-à-vis schemes and programmes

<b>Learning objective</b>	To match selected adaptation measures with GPDP/MGNREGA vis-à-vis schemes and programmes	
<b>Prerequisites / prior knowledge for successful participation</b>	Prior knowledge climate risk and vulnerability and PRA exercises	
<b>Steps (duration)</b>	<b>Step 1.</b> MGNREGA and its climate benefits	15 min
	<b>Step 2.</b> Permissible work under MGNREGA and planning process	15 min
<b>Total duration</b>	30 min	
<b>Methods/Exercises</b>	Input presentation; sharing experiences linked to MGNREGA	
<b>Material</b>	PowerPoint presentation 5.5, handout 5.5, Laptop, LCD projector, chart paper, markers, scheme inventory	
<b>Preparation of the material</b>	You may update the provided data and figures on MGNREGA and its climate benefits, should they no longer be up-to-date (status 2021)	

### Step-by-step approach

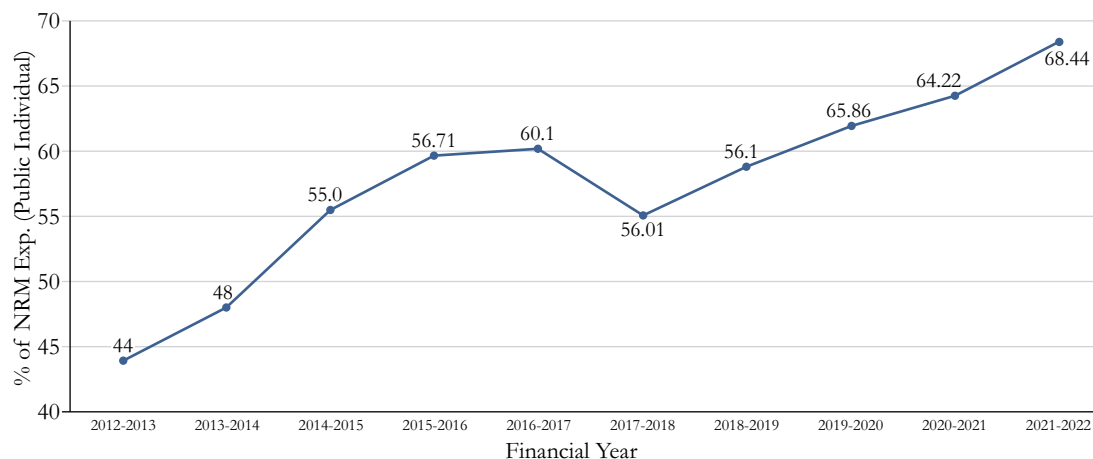
This session approaches in depth the linkage between CCA measures and the programmes GPDP and MGNREGA. **Step 1** gives a general introduction to MGNREGA and its benefits also on behalf of positive impacts to climate and CCA projects, giving examples of MGNREGA/NRM interventions. **Step 2** focuses more on detail what could be possible activities/works under MGNREGA, the planning cycle and the key stakeholders in planning and application process, giving practical examples from the region.

### Step 1. MGNREGA and its climate benefits

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the biggest anti-poverty program in the world with an annual outlay of INR 340 billion giving work to about 1.7 billion persons. Main objective of this act is to enhance the livelihood security of people in rural India by guaranteeing 100 days of wage employment in a financial year to a household whose adult members undertake unskilled manual work as per demand. This is the largest workfare programme in the world. The programme invests heavily on NRM. The expenditure on NRM related works are almost 2/3rd of the total allocation.

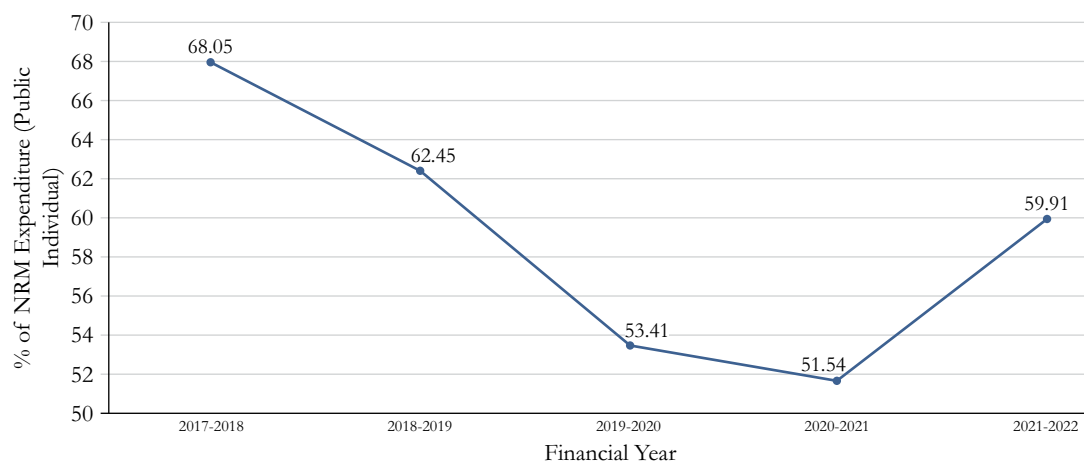
The NRM related expenditure has been steadily rising since 2017-18 at all India level:

**Figure 39.** % of NRM expenditure as a % of total expenditure (public+individual): All India



Source: [http://mnregaweb4.nic.in/netnregalall\\_lvl\\_details\\_dashboard\\_new.aspx](http://mnregaweb4.nic.in/netnregalall_lvl_details_dashboard_new.aspx)

**Figure 40.** % Of NRM expenditure as a % of total expenditure (public + individual): HP



Source: [http://mnregaweb4.nic.in/netnregalall\\_lvl\\_details\\_dashboard\\_new.aspx](http://mnregaweb4.nic.in/netnregalall_lvl_details_dashboard_new.aspx)

In HP, the NRM related expenditure that reached an all-time high of 68 percent in 2017-18 has since been on decline and only started to pick up last year because of Covid related distress. Apart from the program playing a stellar role in providing social protection to most vulnerable during distress, the program too has several positive climate benefits such as ground water recharge, soil protection, water and biodiversity conservation, sustainable food production, and mitigation of land degradation. It also builds local resilience to the effects of climate change such as moisture stress, delayed onset of rainfall, droughts, and floods.

The following matrix (Sinha et.al.) shows how it addressed various climate risks and disaster risks.



Issues Activities	Food security	Water scarcity	Ecological sustainability	Health hazard	Extreme weather events
<b>Well and pond</b>	Increase in total crop area, crop diversity and crop yield	Enhanced provision of water for Irrigation, livestock, domestic purposes, surface water storage and ground water recharge	Efficient water use	Safe water	Drought proofing
<b>Plantation on individual, community and degraded forest land</b>	Edible produce	Ground water recharge, reduced evaporation from soil, surface runoff	Soil and biodiversity conservation, and increase in green cover and carbon sequestration	Improved micro-climate	Drought proofing, flood protection
<b>Watershed management</b>	Enhanced agriculture due to better soil and water management	Better soil moisture regime, surface water storage, Reduced surface runoff	Improving the resilience of ecosystem		Drought proofing, flood protection
<b>Well for potable water</b>		Potable water availability		Sanitation, safe water, prevention of water-borne diseases and contamination.	Drought proofing.
<b>Road construction</b>	Faster supply and distribution of food grains during emergencies			Sanitation, increased facilities in health emergency	Coping for risk and disaster mgt.,

Source: Sinha, et.al

A study in HP, showed the following results;

- Despite rise in temperature where MGNREGS works such as check dams, percolation tanks and desilting of tanks were taken up it had positive impacts on ground water development (both pre and post monsoon)
- Functional tube well no's and drinking water availability rose in areas where recharge interventions and spring shed rejuvenation through SMC and vegetative measures were taken up
- Irrigation command increased as well as cultivable area and yield providing options for vegetable cultivation and enhanced income
- Check dams, land terracing, contour/graded and field bunding have directly contributed to reducing soil erosion
- More number fruit trees and plantations are expected to enhance soil organic carbon

### Group discussion

After a brief explanation about MGNREGA, encourage the participants to reflect on:

1. What is the climate change related stress they see in their area?
2. What are the NRM works done in their areas?
3. What kind of benefit have they observed?

These can be listed in a flipchart.

## Step 2. Permissible work under MGNREGA and planning process

As per Schedule-I of Mahatma Gandhi NREGA, 260 kinds of works/ activities have been identified as permissible works, of which 181 kinds of works relate to Natural Resource Management (NRM) alone and out of the 181 NRM works, 84 are water related. Most of these works help in climate change adaptation

- Soil and Water Conservation Related Works (including Non Water Related Works) (32)
- Ground Water Recharge Related Works (7)
- Irrigation Related Works (19)
- Drainage and other Related Works (16)
- Plantation Related Works (17)
- Land Related Works for Livelihood support (9)

### Step 2: Permissible works

Sc I Cat A: Public Works (NRM)	Cat B: Individual Assets for Vulnerable Sections
<ul style="list-style-type: none"> <li>▪ Water conservation and water harvesting structures</li> <li>▪ Watershed management works</li> <li>▪ Micro and minor irrigation works</li> <li>▪ Renovation of traditional water bodies</li> <li>▪ Afforestation</li> <li>▪ Land development works in common land</li> </ul>	<ul style="list-style-type: none"> <li>▪ Providing infrastructure for irrigation, ie., dug wells, farm ponds and other water harvesting structures</li> <li>▪ Improving livelihoods through Horticulture, Plantations</li> <li>▪ Fallow / Waste Land Development</li> <li>▪ Unskilled wage component in construction of houses</li> <li>▪ Promotion of Livestock</li> <li>▪ Promotion of Fisheries</li> </ul>

### Step 2: Permissible works

Cat C: Common Infrastructure for SHGs under NRLM	Cat D: Rural Infrastructure
<ul style="list-style-type: none"> <li>▪ Durable infrastructure required for bio-fertilizers and post-harvest facilities including pucca storage facilities for agricultural produce</li> <li>▪ Common work-sheds for livelihood activities of self-help groups</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rural Sanitation</li> <li>▪ All weather road connectivity</li> <li>▪ Disaster preparedness / restoration</li> <li>▪ Buildings for Gram Panchayats, women self-help groups' federations, cyclone shelters, Anganwadi centres, village haats and crematoria at the village or block level.</li> <li>▪ Food Grain Storage structures</li> <li>▪ Maintenance of Rural public assets created under MGNREGS.</li> </ul>



Key stakeholders in the MGNREGA planning process are listed below:

1. Wage seekers (job card holders)
2. Gram Sabha (GS)
3. Three-tier Panchayati Raj Institutions (PRIs), especially the Gram Panchayat (GP)
4. Programme Officer at the Block level
5. District Programme Coordinator (DPC)
6. State Government
7. Ministry of Rural Development (MoRD)
8. Civil Society
9. Other stakeholders [viz. line departments, convergence departments, Self-Help Groups (SHGs), etc.]

**The planning cycle for MNREGA is as follows:**

Action to be Taken	Time	Action to be Taken	Time
Gram Panchayat level planning process by Gram Sabha/Ward Sabha.	2 <sup>nd</sup> October	Presentation of District Annual Plan and Labour Budget (LB) to District Panchayat by the DPC/Collector	20 <sup>th</sup> January
Special Gram Sabha for approval of the Gram Panchayat level annual action plan.	3 <sup>rd</sup> October to 30 <sup>th</sup> November	Approval of District Annual Plan by the District Panchayat and submission of the same to State Government	31 <sup>st</sup> of January
Submission of Gram Panchayat Level Plan to the Block Panchayat	5 <sup>th</sup> December	Submission of Labour Budget to the Central Government	15 <sup>th</sup> February
Approval of Block Level Consolidated Annual Plan by Block Panchayat and submission to District Programme Coordinator /collector	20 <sup>th</sup> December	Meetings of the Empowered Committee (G.o.I.) and finalisation of the LB	20 <sup>th</sup> February onwards
Presentation of Block plans by Programme Officer before DPC	19 <sup>th</sup> January	Communication of the LB to the States by Ministry and further by the states to Districts, Blocks, and Gram Panchayats	31 <sup>st</sup> March

### Group exercise

**Time: 15 minutes**

- Show the video on water conservation: <https://www.youtube.com/watch?v=qM6cYWyaVyA&t=143s>
- Ask participants about their experiences linked to MGNREGA
  - How many activities you have taken up using MGNREGA in your area?
  - What role did you play in the planning process?
- Participants can use the handout on permissible work and choose a few public and individual work in their village that they can undertake using MGNREGA to address climate change. This should be paste on the flip chart and discussed.

### Useful literature and databases

- People's Plan Campaign for Gram Panchayat Development Plan (Gpdp) 2021-22. [https://gdpd.nic.in/resources/PPC-2020\\_Booklet.pdf](https://gdpd.nic.in/resources/PPC-2020_Booklet.pdf)
- Government of India, Ministry of Rural Development: The Mahatma Gandhi National Rural Employment Guarantee Act 2005. Available at: <https://nrega.nic.in/Netnrega/stHome.aspx> and various circulars
- Sinha et al.: Adapting to climate change: Opportunities under MGNREGA. Available at: [http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/7144/BhaskarSinha\\_IASC.pdf?sequence=1](http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/7144/BhaskarSinha_IASC.pdf?sequence=1)

- Indian Institute of Science, Bangalore & GIZ (2013): Environmental Benefits and Vulnerability Reduction through Mahatma Gandhi National Rural Employment Guarantee Scheme. Available at: <https://www.giz.de/en/downloads/giz2013-en-environmental-benefits-vulnerability-reduction-india.pdf>
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### Key take-aways

- There is some degree of overlap between CCA-DRR and this needs to be clearly articulated
- The tool (in the case-study) encourages participants in thinking through these linkages in the CCA-DRR framework of the country
- The tool encourages participants to fine tune action plans by assessing alternatives
- Focus on addressing how the benefits can accrue to community and individuals both in short run and long run especially during and after disasters

### Questions for the debriefing phase

- What are your important take-aways/ messages from this case study?
- Which part of the exercise do you find most relevant for your work?
- Do you know how to apply the key concepts to your work?
- Did the session help you to use the GPDP mechanism to integrate NRM plans to address climate and disaster risk?



## Session 5.6 Identifying further relevant support schemes for adaptation projects

<b>Learning objective</b>	To identify programmes and schemes being implemented in the villages related to Agri+, Water Resources and DRR and establish needed CC-linkages	
<b>Prerequisites / prior knowledge for successful participation</b>	Understanding on climate risks/hazards/disasters and activities to address them	
<b>Steps (duration)</b>	<b>Step 1.</b> Understanding the objectives and components of relevant support schemes	30 min
	<b>Step 2.</b> Matching support schemes with adaptation measure and risks addressed	30 min
<b>Total duration</b>	60 min	
<b>Methods/Exercises</b>	Input presentation, reviewing identified risks and adaptation options, matching support schemes with adaptation options based on scheme inventory	
<b>Material</b>	PowerPoint presentation 5.6, handout 5.6, Laptop, LCD projector	
<b>Preparation of the material</b>	You may prepare a list of support schemes relevant for the participants context.	

### Step-by-step approach

This module provides inputs about various schemes to select specific schemes in agriculture, water, eco-systems, livelihoods of for the village level plans (GPDP) and leverage MGNREGA and other schemes/programs to reduce the climate risk.

In **Step 1**, will provide participants with an overview of different support schemes available. The participants will learn more about the schemes' objectives and components as well as about relevant institutions providing the schemes. The step will close with a group discussion on key features of relevant schemes. In **Step 2**, building on the new learnings, adaptation options will be linked to specific support schemes and institutions.

### Step 1. Understanding the objectives and components of relevant support schemes

#### Input presentation

- Present slides 4-13 (presentation 5.2: Identifying-relevant-support-schemes) to the participants.

Figure 41: Key areas of Interest for stakeholders



There are two types of schemes, some are related to specific sectors and the others are holistic in nature. The development schemes in the villages apart from the sectoral development focus on area development in a convergence mode.

**NRM and Livelihood:** This has a strong bearing for PRI members and other sectoral institutions in the villages such as Mahila Karushak Mandals and FPOs, SHG groups and also the village waters security committees. Key related subjects include.

- Agriculture, including agricultural extension
- Land improvement, implementation of land reforms, land consolidation and soil conservation
- Minor irrigation, water management and watershed development
- Animal husbandry (diary, poultry, goatery, etc.) and fishery

Departments of Agriculture and Rural development converge many of these schemes i.e. RKVY, PMKSY, PMFBY, NFSM, MIDH, NMAET, NLM, eNAM, SHC, etc.)

Similarly, Forest Department with union Ministry (MOEFCC) and MORD covers several **eco-system development** schemes such as social forestry, farm forestry and development and collection of minor forest produces. The schemes that address these aspects include: GIM, MSP for MFP, National AYUSH, Mission, NMPB. These schemes reduce climate sensitivity and enhance capacity, therefore reduce vulnerability.

**Habitat development** is the scheme to address the housing needs of the poor. Rural housing and urban shelters are part of specific schemes such as PMAY and supported by MORD and Urban Local bodies under urban development departments of the state.

**Basic needs** like health and education are addressed by ministries like Jalshakti (Ministry of Drinking water and sanitation, Ministry of Health and Family welfare, school and mass education, etc.). They converge several schemes like NRHM/NHM, NRDWP, Mission Indradhanush, ICDS, SBM, PMJDY, PMKKKY, UJALA, NRDWP, NRLM. They cover immunisation, institutional delivery, sanitation, anganwadi systems and pre-schooling activities. Education department is responsible for educational activities. Food security is ensured through PDS. Basic need focussed schemes reduce climate shocks.

**Infrastructure:** This includes rural roads, land development, canals, etc. It can also be storage and warehouses, etc. I&PH, PWD, MORD, agriculture converge various schemes for these activities. Infrastructures enhance capacity of the groups to address climate risks better.

- Present the scheme matrix, the objectives and components of different support schemes to the participants (slides 5-27).

**Hint for the trainer**

- In the scheme matrix trainers should show the linkages of climate hazard/disasters, the adaptation needs and also the linked schemes taking one to two examples and ask participants to present one or two examples.



## Scheme Matrix (slide 5-10)

Hazard/ Risk	Sector	Related Scheme	Adaptation Needs
Drought	Agriculture	Pradhan Mantri Krishi Sinchayee Yojana	<ul style="list-style-type: none"> <li>Watershed Development Component</li> <li>Development of rainfed/ degraded land</li> <li>Programme for reconstruction and preservation of traditional water harvesting structures, construction of canals for transportation of water from surplus to non-surplus areas, establishment of cost-effective drip /sprinkle irrigation practices</li> </ul>
		Rashtriya Krishi Vikas Yojna (RKVY)	<ul style="list-style-type: none"> <li>Preparation of agriculture plans for the districts based on agro-climatic conditions</li> <li>Water Governance</li> <li>Water monitoring and conservation</li> <li>Developing additional water sources through tube wells, dug wells and farm pond</li> <li>Drought resilient crops and cropping system</li> <li>Seed &amp; fodder Plan (including alternative varieties, mini kits etc. keeping in view the impending drought)</li> </ul>
		National Food Security Mission (NFSM)	<ul style="list-style-type: none"> <li>Formation of clusters/farmers groups for sprinklers/rain guns in the event of less rainfall/ prolong dry spell or drought conditions during Kharif or Rabi</li> <li>Use of drought resilient varieties</li> <li>Assessment plan of food grains under Public Distribution System (PDS)</li> </ul>
		National Horticulture Mission (NHM)	<ul style="list-style-type: none"> <li>Drought tolerant perennial fruit crops</li> <li>Promotion of dry land horticulture and crops that can withstand drought conditions with a low consumptive use</li> <li>Introduction/ expansion of area under drought tolerant crops</li> </ul>
		Fodder & Feed Development Scheme	<ul style="list-style-type: none"> <li>Awareness about the feeding requirements of cattle during drought to ensure their health and productivity</li> </ul>
		Integrated Watershed Management Programme (IWMP)	<ul style="list-style-type: none"> <li>Participatory watershed development</li> <li>Hill Slope Collection, Spring water harvesting</li> </ul>
		Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	<ul style="list-style-type: none"> <li>Water conservation programmes</li> <li>Watershed development projects</li> <li>Construction of lined or unlined irrigation channels including field channels under Command Area Development Programme</li> <li>Land levelling and shaping under CAD programme</li> <li>Desilting and weeding of canal system</li> </ul>

Hazard/ Risk	Sector	Related Scheme	Adaptation Needs
		Watershed Development Programmes (Drought Prone Area Programme)	<ul style="list-style-type: none"> <li>Artificial recharging of ground water, watershed programmes in privately owned small/marginal farms, laying of pipes/channels for exclusive transportation of water to dry areas</li> <li>Construction of watershed structures at the right place where water recharge can be enhanced/will be used for life saving irrigation at critical stages of crop growth and during drought situations</li> <li>Construction of “Community Ponds” through Panchayati Raj Institutions (PRI) and maintenance by levying user charges</li> </ul>
Flood	Agriculture	Flood Risk Mitigation Scheme (FRMS)	<ul style="list-style-type: none"> <li>Pilot Projects for development of model Multi-Purpose Flood Shelters</li> <li>Development of River Basin specific Flood Early Warning System</li> <li>Digital Elevation Maps for preparation of Inundation Models for giving early warning to the villagers for evacuation in case of flood</li> </ul>
		Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	<ul style="list-style-type: none"> <li>Spurs and Torrent Control Measures</li> <li>Strengthening of Embankment to prevent river flooding</li> <li>Restoration of damage due to natural floods (manual works) and upgradation of works</li> <li>Development of sites</li> <li>Plantation along embankments</li> </ul>
	Water	Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	<ul style="list-style-type: none"> <li>Construction of rainwater harvesting ponds</li> <li>Desilting and rejuvenation of old community ponds/ waterbodies</li> <li>Construction of check dams</li> <li>Making detention trenches</li> <li>Water source development and traditional knowledge</li> </ul>
Water Scarcity	Drinking Water	National Rural Drinking Water Programme	<ul style="list-style-type: none"> <li>Permanent drinking water security</li> <li>Improve water quality by developing the capability of preliminary water testing at the gram panchayat level</li> <li>Adequate water supply received by all household instead of a mere installation of a water source will be considered as a criterion for fully covered habitation</li> <li>Focus upon economic water security</li> <li>Conjunctive use of surface and groundwater and focus on rainwater harvesting for recharge</li> <li>Revival of traditional systems of water conservation</li> <li>Introduction of catchment protection schemes for surface water</li> </ul>



Hazard/ Risk	Sector	Related Scheme	Adaptation Needs
<b>Learning Scheme's Objective (slide 11-17)</b>			
		Jal Jeevan Mission	<ul style="list-style-type: none"> <li>■ Rural water supply strategy for ensuring potable drinking water security on long-term basis to every rural household and public institution, viz. GP building, School, Anganwadi centre, Health centre, wellness centres, etc.</li> <li>■ Creation of water supply infrastructure so that every rural household has Functional Tap Connection (FHTC) and water in adequate quantity of prescribed quality is made available on regular basis</li> <li>■ Plan for drinking water security</li> <li>■ GPs/ rural communities to plan, implement, manage, own, operate and maintain their own in-village water supply systems</li> <li>■ Capacity building of the stakeholders and create awareness in community on significance of water for improvement in quality of life</li> <li>■ Development of in-village piped water supply infrastructure</li> <li>■ Technological interventions for removal of contaminants where water quality is an issue</li> <li>■ Greywater management</li> </ul>
		Saansad Adarsh Gram Yojana	<ul style="list-style-type: none"> <li>■ Rainwater harvesting-rooftop</li> <li>■ Watershed management especially renovation and revival of traditional water bodies</li> <li>■ Drinking water, preferably treated piped water with household taps</li> </ul>
		National Water Mission	<ul style="list-style-type: none"> <li>■ Water conservation, augmentation and preservation</li> <li>■ Minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management</li> <li>■ Promotion of basin level integrated water resources management</li> <li>■ Focused attention to vulnerable areas including over-exploited areas</li> <li>■ Comprehensive water data base in public domain and assessment of the impact of climate change on water resource</li> <li>■ Preparation of State Specific Action Plans (SSAP)</li> <li>■ Preparation of Detailed Project Reports for demonstrative/benchmarking projects</li> <li>■ Human Resource Development and Capacity Building</li> </ul>

Hazard/ Risk	Sector	Related Scheme	Adaptation Needs
		State Water and Sanitation Mission	<ul style="list-style-type: none"> <li>Provide motivational support to enable village community, Village Water and Sanitation Committees (VWSC) and PRIs to play their rightful role in proper planning, Implementation, operation, maintenance and management of their rural water supply schemes and water resources on sustainable basis.</li> <li>Ensure implementation of awareness/capacity building activities on various aspects of 'drinking water and its quality in rural areas, schools etc.</li> <li>Conducting workshops and trainings</li> </ul>

Scheme	Full Name	Objective
RKVY	Rashtriya Krishi Vikas Yojana	<ul style="list-style-type: none"> <li>To incentivize the states that increase their investment in Agriculture and allied sectors</li> <li>To provide flexibility and autonomy to the States in planning and executing programmes for agriculture (promoting agri-entrepreneurs)</li> <li>To ensure the preparation of Agriculture Plans for the districts and states</li> <li>To achieve the goal of reducing the yield gaps in important crops</li> <li>To maximize returns to the farmers</li> <li>To address the agriculture and allied sectors in an integrated manner</li> </ul>
NFSM	National Food Security Mission	Increasing production of rice, wheat, pulses and coarse cereals; Restoring soil fertility and productivity at the individual farm level; Enhancing farm level economy (i.e., farm profits)
NMSA	National Mission on Sustainable Agriculture	Making agriculture more productive, sustainable, remunerative and climate resilient by promoting location specific integrated /composite farming systems; soil and moisture conservation measures; comprehensive soil health management; efficient water management practices and mainstreaming rainfed technologies.
PKVY	Paramparagat Krishi Vikas Yojana	To produce agricultural products free from chemicals and pesticides residues by adopting eco- friendly, low-cost technologies
NPOF	National Project on Organic Farming	Promotion of organic farming in the country through technical capacity building of all the stakeholders including human resource development, transfer of technology, promotion and production of quality organic and biological inputs
NHM	National Horticulture Mission	NHM's key objective is to develop horticulture to the maximum potential available in the state and to augment production of all horticultural products (fruits, vegetables, flowers, coco, cashew nut, plantation crops, spices, medicinal aromatic plants) in the state.



Scheme	Full Name	Objective
MIDH	Mission for Integrated Development of Horticulture	<ul style="list-style-type: none"> <li>■ Promote holistic growth of horticulture sectors</li> <li>■ Encourage aggregation of farmers into farmer groups like FIGs/FPOs</li> <li>■ Enhance horticulture production, augment farmers income and strengthen nutritional security</li> <li>■ Improve productivity by way of quality germplasm, planting material and water use efficiency through Micro Irrigation</li> <li>■ Support skill development and create employment generation opportunities for rural youth in horticulture and post-harvest management, especially in the cold chain sector</li> </ul>
KCC	Kisan Credit Card	To meet comprehensive credit requirements of the agriculture sector by giving financial support to farmers
PMBFY	Pradhan Mantri Fasal Bima Yojana	Ensuring flow of credit to the agriculture sector; which will contribute to food security, crop diversification and enhancing growth and competitiveness of agriculture sector besides protecting farmers from production risks
MKSP	Mahila Kisan Sashaktikaran Pariyojana	To empower women in agriculture by making systematic investments to enhance their participation and productivity, as also create and sustain agriculture-based livelihoods of rural women
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana	<ul style="list-style-type: none"> <li>■ To achieve convergence of investments in irrigation at the field level</li> <li>■ To enhance the physical access of water on the farm</li> <li>■ To expand cultivable area under assured irrigation (Har Khet ko pani)</li> <li>■ To make best use of water through new technologies and practices</li> <li>■ To reduce wastage and to increase water availability on-farm</li> <li>■ To enhance the adoption of precision-irrigation (More crop per drop)</li> <li>■ To enhance aquifers recharge and to introduce sustainable water conservation practices.</li> </ul>
KUSUM	Kisan Urja Suraksha evam Utthaan Mahabhayan	<p>Increasing farmers' income, provide reliable source for irrigation and de- dieselise the farm sector. Under the scheme, farmers, cooperative societies, farmers-cooperative groups, and panchayats can apply to install solar pumps. The total cost incurred in implementing the project is so planned that the farmers' financial burden is negligible. The overall cost is divided into three categories:</p> <ul style="list-style-type: none"> <li>■ Government to provide a 60% subsidy directly to farmers</li> <li>■ 30% will be provided through soft loans to farmers</li> <li>■ 10% actual cost to be incurred by farmers</li> </ul>

Scheme	Full Name	Objective
CADWM	Command Area Development and Water Management	To enhance utilization of irrigation potential created and improve agriculture productivity and production on a sustainable basis through integrated and coordinated approach involving multidisciplinary team
DAY-NRLM	Deendayal Antyodaya Yojana-National Rural Livelihoods Mission	To alleviate rural poverty and create sustainable livelihood opportunities for the rural poor
SAGY	Saansad Adarsh Gram Yojana	<ul style="list-style-type: none"> <li>■ To trigger processes which lead to holistic development of the identified Gram Panchayats</li> <li>■ To substantially improve the standard of living and quality of life of all sections of the population</li> </ul>
SBM-G	Swachh Bharat Mission-Gramin	<ul style="list-style-type: none"> <li>■ Bring about an improvement in the general quality of life in the rural areas, by promoting cleanliness, hygiene and eliminating open defecation.</li> <li>■ Motivate Communities and Panchayati Raj Institutions (PRI) to adopt sustainable sanitation practices and facilities through awareness creation and health education.</li> </ul>
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme	<ul style="list-style-type: none"> <li>■ Enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year, to every household whose adult members volunteer to do unskilled manual work</li> <li>■ To create durable assets (such as roads, canals, ponds, wells)</li> </ul>
WDC	Watershed Development Component of PMKSY	To improve water conservation, irrigation facility, and land use pattern leading to increased agricultural productivity
CAMPA	Compensatory Afforestation Fund Management and Planning Authority	To promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.
PMKVY	Pradhan Mantri Kaushal Vikas Yojna	Enable and mobilize many Indian youth to take up skill training and become employable and earn their livelihood. Increase productivity of the existing workforce and align the training and certification to the needs of the country
SS	Samagra Shiksha	<ul style="list-style-type: none"> <li>■ Provision of quality education and enhancing learning outcomes of students</li> <li>■ Bridging Social and Gender Gaps in School Education</li> <li>■ Ensuring equity and inclusion at all levels of school education</li> <li>■ Ensuring minimum standards in schooling provisions</li> </ul>
ADP	Aspirational District Programmes	<ul style="list-style-type: none"> <li>■ To expeditiously improve the socio-economic status of 117 districts from across 28 states</li> <li>■ The programme focusses on 5 main themes - Health &amp; Nutrition, Education, Agriculture &amp; Water Resources, Financial Inclusion &amp; Skill Development, and Basic Infrastructure, which have direct bearing on the quality of life and economic productivity of citizens</li> </ul>



Scheme	Full Name	Objective
DMDF	District Mineral Development Fund (DMDF)	To work for the interest of the benefit of the persons and areas affected mining related operations in such manner as may be prescribed by the State Government
MPLADS	Member of Parliament Local Area Development Scheme	To enable the Members of Parliament (MP) to suggest and get executed developmental works of capital nature based on locally felt needs with emphasis on creation of durable assets
MLALADS	Member of Legislative Assembly Local Area Development Scheme	To create local need-based infrastructure, to create assets of public utility and to remove regional imbalances in development. This scheme is implemented in rural areas as well as urban areas of a state
TSS	Tribal Sub Scheme	To channelize the flow of outlays and benefits from the general sectors in the Central Ministries/ Departments for the development of Scheduled Castes and Schedules Tribes at least in proportion to their population, both in physical and financial terms
RRR	Repair, Renovation and Restoration of Water Bodies	<ul style="list-style-type: none"> <li>■ Comprehensive improvement and restoration of water bodies thereby increasing tank storage capacity</li> <li>■ Ground Water Recharge</li> <li>■ Increased availability of drinking water, improvement in agriculture/horticulture productivity, improvement of catchment areas of tank commands</li> <li>■ Community participation and self-supporting system for sustainable management for each water body</li> <li>■ Capacity Building of communities, in better water management</li> </ul>

#### WCD Scheme's Objective and Components (slide 18-22)

Scheme	Objective	Component
Beti Hai Anmol Yojna	To provide financial assistance for the education of daughters. This scheme is for girls of BPL families up to two girl children. After their birth, the department deposits rupees 10,000 per girl child in the post office/ Bank account. These girls get scholarship ranging from Rs. 300 to Rs.1200 from first to 12th Class for their books/dresses etc.	Encourage education, betterment of girls
Mukhya Mantri Kanyadan Yojna	To provide financial help to poor, needy, destitute families for marrying off their daughters/widows/divorcees.	Financial assistance for betterment of women
Self-Employment Assistance for women	To empower women through development of their entrepreneurial skills by eliminating constraints faced by them in their sphere of trade. In this scheme women are granted rupees 2500 for establishing any project or venture who have annual income not more than 35,000 per annum.	Financial assistance to eligible women to be self-employed
Mahila Vikas Nigam	To provide self-employment to the women by providing loan on subsidized interest rates	Support women entrepreneurs and women workforce

Scheme	Objective	Component
Mother- Teresa Asahaya Matri Sambal Yojna	To provide financial assistance to widow women for educating and looking after their children up to two children till, they attain age of 18 years. In this scheme women get rupees 3000 per annum per child	Create sustainable growth of widow that further helps with improving their standard of living in society
Vishesh Mahila Uthaan Yojna	To train & rehabilitate women in moral danger. Under this scheme beneficiary, women are provided vocational training, monthly stipend, financial loan to be self-employed	Rehabilitation of physically and sexually abused women through technical and vocational training.
Himachal Pradesh Mahila Vikas Protsahan Yojana	Under the scheme, a state level award for the persons/ organization working for the development and empowerment of women in the field of health, education, sports, social services and art and culture, is granted.	Women empowerment
Indira Gandhi Matritava Sahyog Yojana	Cash incentives to to-be mothers and new mothers so that they have access to better nutrition and health standards; Encourage women to breastfeed exclusively for the first 6 months and practice best feeding and nutrition standards; Promoting better care and service utilization in times of pregnancy, delivery and lactation.	Improve the health and nutrition status of pregnant/lactating women
Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (SABLA)	The scheme aims at covering all out-of-school Adolescent Girls in the age group of 11 to 18 years who would assemble at the Anganwadi Centre on a fixed day at regular interval	Nutrition provision, Iron and Folic Acid (IFA) supplementation; Health check-up and Referral services, Nutrition & Health Education (NHE), Counseling / Guidance on family welfare, ARSH, childcare practices and home management, Life Skill Education and accessing public services, Vocational training for girls aged 16 and above under National Skill Development Program (NSDP)
Kishori Shakti Yojana	To empower adolescent girls, to enable them to take charge of their lives. It is viewed as a holistic initiative for the development of adolescent girls. The programme through its interventions aims at bringing about a difference in the lives of the adolescent girls. It seeks to provide them with an opportunity to realize their full potential.	Iron Folic Acid (IFA) supplementation, Health check-up and Referral services, Nutrition & Health Education (NHE), Counseling / Guidance on family welfare,



Scheme	Objective	Component
		Adolescent Reproductive & Sexual health (ARSH), childcare practices, Life Skill Education and accessing public services vocational training for out of School adolescent girls
Integrated Child Protection Scheme	To ensure the protection of rights of children and providing all associates services to the children who need care and protection. They get free education, food and health care by the department.	'Protection of child rights' and 'best interests of the child
Integrated Child Development Services	<ul style="list-style-type: none"> <li>■ To improve the nutritional and health status of children in the age group of 0-6 years.</li> <li>■ To lay the foundation for proper psychological, physical and social development of the child.</li> <li>■ To reduce the incidence of mortality, morbidity, malnutrition and school dropout.</li> <li>■ To achieve effective co-ordination of policy and implementation amongst the various departments to promote child development, and</li> <li>■ To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.</li> </ul>	<ol style="list-style-type: none"> <li>1. Nutrition and Health Education</li> <li>2. Immunization</li> <li>3. Supplementary nutrition</li> <li>4. Health Check up</li> <li>5. Pre School Education</li> <li>6. Referral Services</li> </ol>

#### I&PH Scheme's Objective and Components (slide 23-25)

Scheme	Objective	Component
National Rural Drinking Water Supply Programme (NRDWP)	The programme seeks to ensure permanent drinking water security in rural India. It also aims to improve water quality by developing the capability of preliminary water testing at the gram panchayat level.	Provide basic amenities (safe drinking water) to the rural India, Water Quality Monitoring & Surveillance, Communication and Capacity Development, Research and Development, Programme and Project Monitoring and Evaluation
Urban Water Supply Scheme	The project aims to enhance water resources management and water supply particularly in water stressed urban and peri-urban areas	Developing State-wide/City-wide programs for improving Urban water supply delivery and accountability
Hand Pumps Programme	To mitigate the people's misery due to shortage of drinking water in different pockets of drought prone and acute water scarcity areas	Although Hand Pumps usually do not provide coverage of a habitation, (due to limitation of rigs operating along road-sides only) they are supplementing the existing piped water supply and have been installed in drought prone areas, areas of acute water scarcity and other problematic areas

Scheme	Objective	Component
Sewerage Programme	As towns in the State mostly serve as health resorts, environment improvement assumes special significance particularly to avoid pollution of the rivers and other water bodies of the State. Secondly, to abolish carrying of night soil on head load and scavenging system in the country/states, the Government has given top priority to connect dry latrine system into water pour system. Hence, the sewerage programme has assumed immense importance. Under this programme sewerage facilities are proposed to be provided in all towns of the State	Health and Sanitation
Flood Protection	Evaluate the risks to existing development in flood hazard areas and identify actions to reduce risks to life and property	Livelihood support through jobs in works related to River management, flood control, anti- erosion, drainage development, flood proofing works besides flood prone area development programme in critical regions. It would also include restoration of damaged flood control/ management work
Command Area Development	The command area development programme (CADP) was initiated under Centrally Sponsored Scheme with the objective of fast utilization of created irrigation potential and optimum agriculture production from irrigable land	To bridge gap between potential created and utilized Command Area Development activities (CAD) are also extended not only to medium schemes but also to minor irrigation schemes

### Components Convergence (slide 26-28)

Scheme	Central/ State Government Department	Components that can be converged
Swachh Bharat Mission (Gramin) [SBM-G]	Department of Drinking Water and Sanitation, M/o Jal Shakti	Greywater management -soak pits (individual/community), waste stabilization ponds, etc.
MGNREGS	M/o Rural Development	All water conservation activities under Natural Resource Management (NRM) component
Watershed Development Component (WDC of PMKSY)	D/o Land Resources	Watershed management/ RWH/artificial recharge, creation/ augmentation of water bodies, etc.
Repair, Renovation and Restoration (RRR) of Water Bodies	D/o Water Resources, River Development & Ganga Rejuvenation	Restoration of large water bodies
Rastriya Krishi Vikas Yojana (RKVY)	M/o Agriculture, Cooperation and Farmers Welfare	Water related works
Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)		Provision of micro-irrigation for various water-intensive crops to reduce drawl of water from aquifers



Scheme	Central/ State Government Department	Components that can be converged
Compensatory Afforestation Fund Management and Planning Authority (CAMPA)	M/o Environment, Forests and Climate Change	Afforestation, regeneration of forest ecosystem, restoration and strengthening of springs, watershed development, etc.
Pradhan Mantri Kaushal Vikas Yojna (PMKVY)	M/o Skill Development	Skill Development, training, etc. for human resources required for rural water supply schemes
Samagra Shiksha	M/o Human Resource Development	Provision of drinking water supply in schools
Aspirational District Programmes	NITI Aayog	Water conservation activities taken up under discretionary funds with District Collector
District Mineral Development Fund (DMDF)	State	Water conservation activities on large scale
MPLAD	Ministry of Statistics and Programme Implementation (MoSPI)	In-village infrastructure
MLALAD	State	In-village infrastructure
Tribal Sub Scheme	Ministry of Tribal Affairs and State	In-village infrastructure
National Rural Livelihoods Mission/ State Rural Livelihood Mission	M/o Rural Development	Developing Women entrepreneurs and SHG led enterprises for water supply services

## Step 2. Matching support schemes with adaptation measure and risks addressed

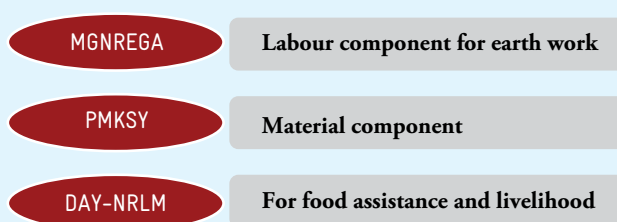
### Participatory exercise

- Present slide 16 (presentation 5.6) to the participants to introduce a case study based on which the next exercise is exemplarily demonstrated.
- You may use the presented case study example to demonstrate the participants how to link activities of adaptation projects to support schemes (slides 18 and 19).
- Provide the participants with scheme cards and the scheme inventory handout
- All the scheme cards will be (name generated from the scheme inventory handout) shuffled and given to participants.
- They will pin as per their understanding of the schemes.

**Further example:** Crop-water budgeting and choice of crops to manage moisture stress. They can get individual drip irrigation sets under KUSUM, can have a community storage system for vegetables or fruits under RKVY and can get food assistance under NFSM.

### Case study: Soil moisture conservation

1. What will change in your village if you undertake this?  
Probable answer: It will improve water availability for us and livestock, soil moisture will improve in the long run
2. Who will be involved? (individual or community, which vulnerable groups should get a priority)  
Probable answer: Groups rural poor under wage employment
3. Where the activity will take place?  
Probable answer: If possible, they should identify a village under highly vulnerable map (facilitator can use a map, else they can just name a place and the facilitator can ask, why this place)
4. When you expect the project to be completed?  
Probable answer: 1 year, 3 years (the facilitator can get response to see why there is variation)
5. How will we link available schemes to this project?



Here the focus is on rejuvenating a spring, where the labour and material components have been converged with food assistance from various schemes.

- Ask the participants to do the same for their adaptation projects. Read out key features of relevant schemes from scheme inventory and ask participants to pin the schemes and present their learning for their designed adaptation strategy.
- Ask the participants to list suitable schemes for the prioritized adaptation measures on worksheet 1 of handout 5.6.

### Useful literature and databases

- Government of India, Ministry of Rural Development (2009): Guidelines for Convergence of NREGS with Programmes of Ministry of Agriculture for enhancing productivity. Available at: [https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline\\_conver\\_MOA.pdf](https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline_conver_MOA.pdf)
- Government of India, Ministry of Rural Development (2021): The Mahatma Gandhi National Rural Employment Guarantee Act. Available at: [https://nrega.nic.in/netnrega/circular\\_new.aspx](https://nrega.nic.in/netnrega/circular_new.aspx)
- RKVY Division, Ministry of agriculture and farmers welfare: Operational Guidelines for Innovation and Agri Entrepreneurship Cell under RKVY-RAFTAAR (2017-18 TO 2019-20). Available at: [https://rkvy.nic.in/static/download/pdf/RKVY-RAFTAAR\\_Ent.pdf](https://rkvy.nic.in/static/download/pdf/RKVY-RAFTAAR_Ent.pdf)
- PMKSY Division, Ministry of agriculture and farmers welfare (2019): Guidelines. Available at: <http://pmksy.gov.in/Guidelines.aspx>
- Government of Himachal Pradesh, Rural Development Departments: Schemes and Programmes for HP. Available at: <https://hbprural.nic.in/Schemes.htm>
- Department of Agriculture, Himachal Pradesh (2017): A farmer friendly handbook, Schemes and Programmes 2017. Available at: <http://farmer.gov.in/imagedefault/handbooks/FFH-2017HimachalPradesh-English.pdf>



### Key take-aways

- The participants would be able to link various schemes or their components to various climate and disaster risks
- When choosing the appropriate climate adaptation measure estimate the budget and see whether any scheme or group of schemes can cover maximum cost. See whether beneficiaries are willing to contribute
- Focus on addressing how the benefits can accrue to community and individuals both in short run and long run

### Questions for the debriefing phase

- Have you already benefited from a support scheme?
- Do you consider any of the programmes mentioned useful for your adaptation project ideas/problems?
- Have you already discussed your project idea and the possibility of receiving support from support schemes with your community?

### Hints for the trainer

Since module 5 is heavy on content, the trainer must give examples and make it more interactive. He should beam the scheme inventory specific areas when such discussion is taking place.

## Session 5.7 How to apply for the relevant schemes for CCA-DRR

<b>Learning objective</b>	To apply for the identified programmes/schemes and matching with adaptation needs	
<b>Prerequisites / prior knowledge for successful participation</b>	Understanding on climate risks/hazards/disasters and activities to address them	
<b>Steps (duration)</b>	<b>Step 1.</b> Understanding the application procedure	30 min
	<b>Step 2.</b> Role Play: Apply for a scheme	30 min
<b>Total duration</b>	60 min	
<b>Methods/Exercises</b>	Input presentation, Role play simulating an application case	
<b>Material</b>	PowerPoint presentation 5.7, handout 5.7, Laptop, LCD projector	
<b>Preparation of the material</b>	Focus on the application processes of support schemes identified by the participants in Session 5.6 and prepare appropriate materials for them, if needed.	

### Step-by-step approach

This module provides inputs for familiarising participants how to apply for identified schemes to accomplish and adaptation strategy for select sector in the village level planning process.

In **Step 1**, participants will start discussing the identified schemes and zero down on an adaptation strategy based on an already identified climate risk.

In **Step 2**, the participants will put theory in practice and are guided through an application process for support schemes identified in Session 5.6 relevant to their adaptation project.

## Step 1. Understanding the application procedure

### Input presentation

- Present slide 4-9 (presentation 5.6: Applying for relevant schemes) to the participants.

### How to apply for the Scheme (slide 4-9)

**Table 8.** Schemes and their application procedure

Scheme	Application Procedure
<b>Rashtriya Krishi Vikas Yojana (RKVY)</b>	<ol style="list-style-type: none"> <li>Contact- District Agriculture Officer / Project Director ATMA</li> <li>Visit State's Agricultural portal to apply online for a particular scheme</li> <li>Submission of list of projects proposed to be implemented under the scheme to Department of Agriculture, Cooperation &amp; Farmers Welfare (DAC&amp;FW) after the same is approved by the State Level Sanctioning Committee (SLSC)</li> </ol>
<b>Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)</b>	<ol style="list-style-type: none"> <li>Contact- District Agriculture Officer / District Soil Conservation Officer / Project Director ATMA / District Horticulture Office</li> <li>Online- Visiting official Website Pradhan Mantri Krishi Sinchayee Yojana i.e., <a href="http://pmksy.gov.in/">http://pmksy.gov.in/</a></li> </ol>
<b>National Food Security Mission (NFSM)</b>	<ol style="list-style-type: none"> <li>The Gram Panchayats is responsible for the selection of beneficiary farmers</li> <li>Selection of beneficiaries should be made by adopting a "Participatory" approach</li> </ol>
<b>Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)</b>	<ol style="list-style-type: none"> <li>A NREGA Job Card application form may be availed from the local Gram Panchayat, or the application may be made on plain paper.</li> <li>Currently, the MGNREGA job card application process is conducted completely offline primarily because of the low internet penetration in rural India. However, the Official NREGA website (<a href="http://www.nrega.nic.in">www.nrega.nic.in</a>) does give individuals the option to download NREGA Job Card Application Form for free.</li> </ol>
<b>Pradhan Mantri Fasal Bima Yojana (PMBFY)</b>	Nearest branches of Bank/ PACS/Cooperative Banks/ Common Service Centre (CSC) Empaneled General Insurance Companies notified for the area and District Agriculture Officer/Block Development Officer may be contacted or visit web portal <a href="http://www.pmfby.gov.in">www.pmfby.gov.in</a> .
<b>Paramparagat Krishi Vikas Yojana (PKVY)</b>	<ol style="list-style-type: none"> <li>At District level: Contact District Agricultural Officers for application procedure detail</li> <li>Visit the official portal to apply online Pradhan Mantri Paramparagat Krishi Vikas Yojana and submit Application form</li> </ol>
<b>Mahila Kisan Sashaktikaran Pariyojana (MKSP)</b>	<ol style="list-style-type: none"> <li>Contact to the department of State rural livelihood mission. The responsible department will register you in the MKSP scheme.</li> <li>Data entry operator of MKSP will fill your application form from the departmental online portal of MKSP.</li> <li>You must submit your all document to SRLM department.</li> <li>After the successful submission of the application SRLM will forward your application to NRLM.</li> </ol>
<b>Mission for Integrated Development of Horticulture (MIDH)</b>	Beneficiary can register details through online in Hortnet or submit the application to DHO along with required documents



Scheme	Application Procedure
<b>National Rural Livelihood Mission (NRLM)</b>	<ol style="list-style-type: none"> <li>1. District Mission Management Units (DMMU) and Block Mission Management Units (BMMU) are established to implement the programme</li> <li>2. Visit the Official Website of Deendayal Antyodaya Yojana i.e. <a href="http://aajeevika.gov.in">aajeevika.gov.in.</a>, to apply online</li> </ol>
<b>Integrated Child Development Services (ICDS)</b>	Registration at Anganwadi Centres (AWC) through Anganwadi worker (AWW) and an Anganwadi Helper (AWH)
<b>National Rural Drinking Water Supply Programme (NRDWP)</b>	<ol style="list-style-type: none"> <li>1. Apply online by submitting the form on <a href="http://ejalshakti">ejalshakti</a> website</li> <li>2. Contact Jal Shakti Vibhag for the detail application procedure</li> </ol>
<b>Command Area Development (CAD)</b>	<ol style="list-style-type: none"> <li>1. Contact Jal Shakti Vibhag for the detail application procedure</li> <li>2. The Ministry of Water Resources coordinates and monitors the implementation of CADWM at the national level and the Programme is being implemented through the Command Area Development Authorities (CADAs) at the State level</li> </ol>
<b>Swachh Bharat Mission-Gramin (SBM-G)</b>	<ol style="list-style-type: none"> <li>1. Contact the concerned officer of SBM-G from Rural Development Department</li> <li>2. Contact Jal Shakti Vibhag for the detail application procedure</li> </ol>
<b>Watershed Development Component of PMKSY</b>	<ol style="list-style-type: none"> <li>1. DRDA/Zilla Parishad selects the villages for development of watershed projects</li> <li>2. Project implementation agency is also selected by DRDA / Zilla Parishad</li> </ol>
<b>Repair, Renovation and Restoration (RRR) of Water Bodies</b>	<ol style="list-style-type: none"> <li>1. At the water body level, the Detailed Project Reports (DPRs) would be prepared, and works would be implemented by Water Users' Association (WUA) / Local Panchayat / A government agency identified by the District Level Implementing Agency (DLIA).</li> <li>2. The proposals identified / received by DLIA would be scrutinized / included in the District Plan and forwarded to State Level Nodal Agency</li> </ol>
<b>Saansad Adarsh Gram Yojana (SAGY)</b>	Lok Sabha MP has to choose a Gram Panchayat from within his/her constituency and Rajya Sabha MP a Gram Panchayat from the rural area of a district of his/her choice in the State from which he/she is elected. Nominated MPs may choose a Gram Panchayat from the rural area of any district in the country.
<b>Pradhan Mantri Kaushal Vikas Yojna (PMKVY)</b>	The applicant will have to apply online to get the training from the official website of the PMKVY. Here is the direct link to the website; <a href="http://pmkvyofficial.org">http://pmkvyofficial.org</a> . On the webpage, the applicant will have to enter the basic information about them. As the next step, the applicant will have to choose the course they want to pursue under PMKVY. The applicant can choose one of 40 options like constructions, electronics, food and processing, furniture, gems and jewelry, and many others. Now as the last step you will have to choose the training center as per their feasibility. Candidates can also visit the training center to know more about the course timing and its duration
<b>Samagra Shiksha (SS)</b>	Contact appointed officer of Project Approval Board (PAB) under Department of School Education and Literacy responsible for implementation of activities under Samagra Siksha

Scheme	Application Procedure
<b>Member of Parliament Local Area Development Scheme (MPLADS)</b>	<ol style="list-style-type: none"> <li>1. The MPs have a recommendatory role under the scheme. They recommend their choice of works to the concerned district authorities who implement these works by following the established procedures of the concerned state government.</li> <li>2. The district authority is empowered to examine the eligibility of works sanction funds and select the implementing agencies, prioritize works, supervise overall execution, and monitor the scheme at the ground level.</li> <li>3. The district authorities get the works executed through the line departments, local self-governments or other government agencies. In some cases, the district authorities get the works executed through reputed non-government organisations</li> </ol>
<b>Member of Legislative Assembly Local Area Development Scheme (MLALADS)</b>	Each MLA may give his choice of works along with the implementing Agencies to the concerned Deputy Commissioner at any point of time against the allocated fund for implementation by following the established procedures
<b>District Mineral Development Fund (DMDF)</b>	Contact Collector of the respective district or Revenue Divisional Commissioner, whoever is the chairperson of DMDF
<b>Green India Mission (GIM)</b>	<ol style="list-style-type: none"> <li>1. Village level- It will be the Gram Sabha and the Committees mandated by the Gram Sabha, including revamped JFMCs, which will plan and implement the Mission activities at the village level. The revamping of JFMCs includes setting up of JFMCs by the Gram Sabha following due process as may be specified in State Panchayati Raj Act or in the JFM guidelines. The plans will be approved by the respective Gram Sabha. It will have explicit linkages with Panchayat level planning to ensure maximum convergence.</li> <li>2. Contact District level- District Forest Development Agency</li> </ol>
<b>Compensatory Afforestation Fund Management and Planning Authority (CAMPA)</b>	<ol style="list-style-type: none"> <li>1. For the benefits and application procedure, please contact your nearest District Forest Officer</li> <li>2. Contact officers from State CAMPA under Forest and Environment Department</li> </ol>
<b>Aspirational District Programmes (ADP)</b>	Contact State Level ‘Prabhari’ Officers & District Collectors responsible for implementation of activities under ADP
<b>Tribal Sub Scheme (TSS)</b>	Contact local Tribal Development Department for the detail application procedure

## Step 2. Role play: Apply for a scheme

- Ask the participants to list the priority adaptation measure they want to address e.g., Soil Moisture Conservation
- List all mentioned individual and community level actions on a flip chart visible to the group

### Role play (use the role play handout)

- For the role play, the participants will be divided into three groups (villagers, officials, and GP level committee).
- There will be one facilitator for each group who will help members identify the procedures and eligibilities from scheme inventory to apply for specific plans that need to be cleared by the committee and recommended for sanction
- Indicate the participants to use the role play cards in the handout 5.7 and the scheme inventory from session 5.6
- Explain the process and ask participants in plenary what are the challenges they face now and how they can be better prepared in future.



### Process of the role play:

- Encourage group A (villagers) to focus on a specific adaptation measure and to identify climate risks and related schemes. The facilitator will note down the selected schemes and pass them on to the second group (Group B: officials).
- Group B will seek out the schemes from the scheme inventory and the eligibility norms accordingly.
- After filling out the form handed out with the role play handout, Group A will pass on their proposal to Group B for review.
- After group B has reviewed and discussed the proposal, they will make a presentation to group C to make their case.
- Group C will make a recommendation.

### Useful literature and databases

- Government of India, Ministry of Rural Development (2009): Guidelines for Convergence of NREGS with Programmes of Ministry of Agriculture for enhancing productivity. Available at: [https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline\\_conver\\_MOA.pdf](https://nrega.nic.in/netnrega/writereaddata/Convergence/circulars/guideline_conver_MOA.pdf)
- Government of India, Ministry of Rural Development (2021): The Mahatma Gandhi National Rural Employment Guarantee Act. Available at: [https://nrega.nic.in/netnrega/circular\\_new.aspx](https://nrega.nic.in/netnrega/circular_new.aspx)
- RKVY Division, Ministry of agriculture and farmers welfare: Operational Guidelines for Innovation and Agri Entrepreneurship Cell under RKVY-RAFTAAR (2017-18 TO 2019-20). Available at: [https://rkvy.nic.in/static/download/pdf/RKVY-RAFTAAR\\_Ent.pdf](https://rkvy.nic.in/static/download/pdf/RKVY-RAFTAAR_Ent.pdf)
- PMKSY Division, Ministry of agriculture and farmers welfare (2019): Guidelines. Available at: <http://pmksy.gov.in/Guidelines.aspx>
- Government of Himachal Pradesh, Rural Development Departments: Schemes and Programmes for HP. Available at: <https://hprural.nic.in/Schemes.htm>
- Department of Agriculture, Himachal Pradesh (2017): A farmer friendly handbook, Schemes and Programmes 2017. Available at: <http://farmer.gov.in/imagedefault/handbooks/FFH-2017HimachalPradesh-English.pdf>

### Key take-aways

- Participants will be familiar with the application procedure for various schemes
- The tool encourages participants to fine tune action plans by assessing alternatives

### Debriefing questions

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- How did the session and exercise support you in understanding the application process for relevant support schemes for adaptation projects?

## Module 6. Implementing CCA projects

<b>Learning objective</b>	To learn key concepts that facilitate the implementation of adaptation projects in the framework of a GPDP
<b>Duration</b>	Shortest version: 45 min Complete version: 2 h

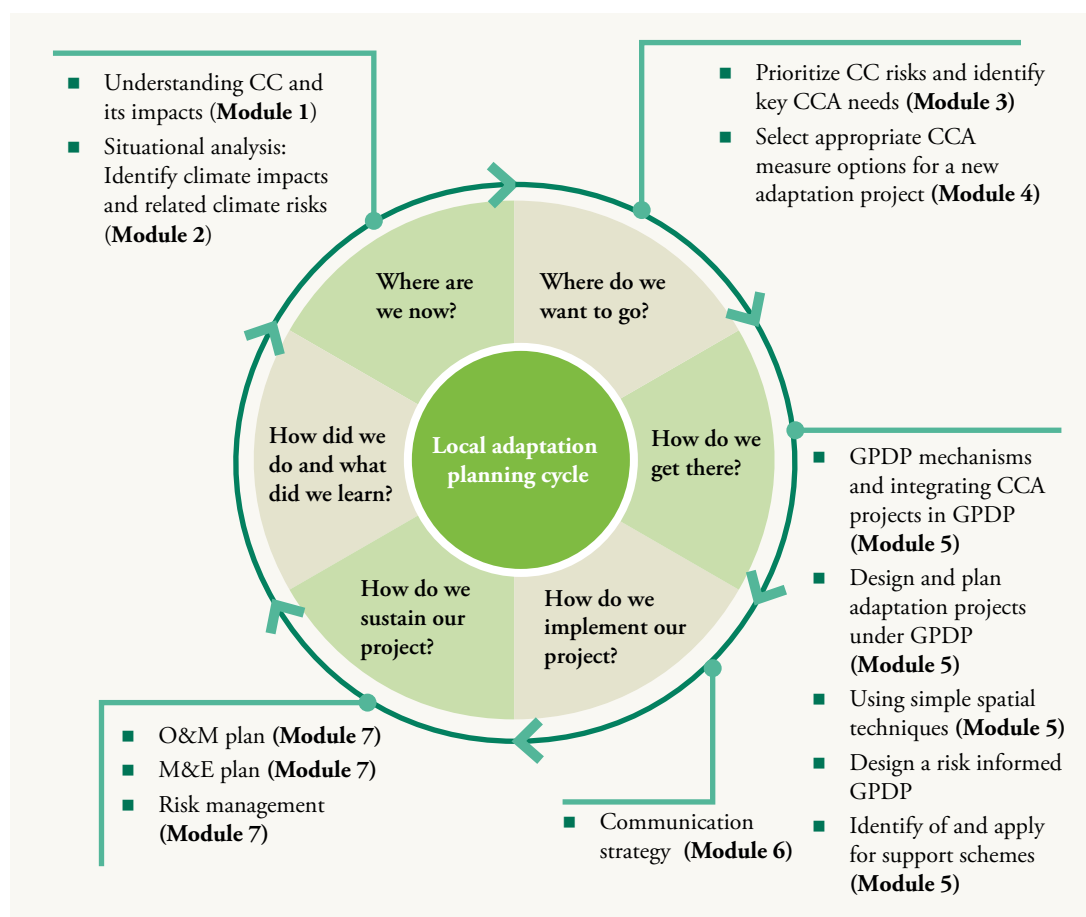
### Module planner

Duration	Sessions of module	Shortest version	Complete version
2 h	Session 6.1 Develop a communication strategy	Step 2 (45 min)	X

### Integration of Module 6 along the local adaptation planning cycle

The methodology used by the Capacity Building Package follows the logical processes of local adaptation planning. The figure below shows the arrangement of the modules of the CDP, their main steps and methods employed. The colour blue indicates that you are in Module 6 and Step 6 of the Local Adaptation Planning cycle, which teaches key concepts for developing a communication strategy in the framework of a GPDP. The strategies and concepts developed in this module add value to participants' adaptation projects and should be considered from the project start.

In the ExcelTool you will find tabs in the same colours. Here you can document the results achieved by your group of participants in module 6.



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## Session 6.1 Developing a communication strategy

<b>Learning objective</b>	To improve acceptance and public visibility of adaptation projects by creating and applying an internal and external communication strategy	
<b>Prerequisites / prior knowledge for successful participation</b>	A rough design of a CCA project is developed	
<b>Steps (duration)</b>	<b>Step 1.</b> Developing an internal communication strategy	45 min
	<b>Step 2.</b> Developing an external communication strategy	45 min
	<b>Step 3.</b> Using social media	30 min
<b>Total duration</b>	2 h	
<b>Methods/Exercises</b>	Input presentation, active listening as the heart of communication, developing an internal and external communication strategy, storytelling, posting on social media	
<b>Material</b>	Beamer, laptop, PowerPoint presentation 6.1, handout 6.1, moderation material as cards and flipcharts, desirable: participants have internet access	
<b>Preparation of the material</b>	You may adapt the examples provided that facilitate the exercises in this session to the context of the participants.	

### Step-by-step approach

This session provides inspiration and tools for identifying and creating internal and external communication strategies to the local context of the participants. Along the way, an understanding of how communication works, what tools exist and how to achieve visibility will be provided.

**Step 1**, provides the participants with general background knowledge on communication concepts and common barriers for effective communication. The participants will learn to adapt the knowledge on their own context and create an internal communication strategy. Participants are also invited to share experiences and difficulties in communication from their contexts.

In **Step 2** participants assess the means of external communication and importance of visibility. They will learn how to realise external communication by fast writing practise and create an external communication strategy for their own context.

Finally, in **Step 3** the external communication will focus on social media and their importance and challenges in praxis, as part of the external communication strategy.

### Step 1. Developing an internal communication strategy

#### Entry exercise: Active listening as the heart of communication

The session starts with a warm-up exercise that sensitises participants to communication and its barriers. In this exercise, participants will analyse how differently communicated messages can be received and change when they are passed on.

**Time: 15 min**

- Ask the participants to form groups of 3 persons (Person A, B and C)
- Engage each group to do the following exercise: Engage them to talk about their experiences with different communication channels and to present and discuss their own experiences
  - Person A narrates a story in 3 minutes.
  - Person B re-narrates person A's story as accurately as he/she remembers not using more than 3 minutes.

- Person C listens actively and at the end reflects together with person A and B on the differences in the same story told by two people.
- After the exercise, reflect with the group what happened and what could be the reason for what happened. To do this, choose about three people from different groups who had different roles to count their experiences.

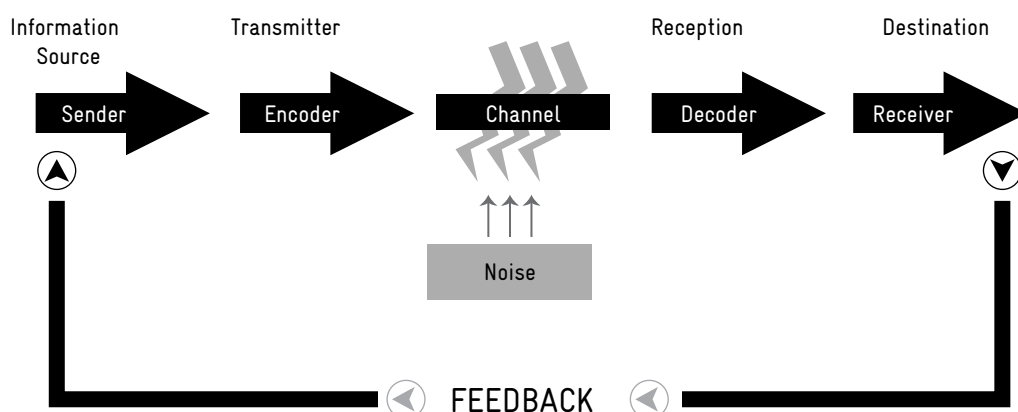
### Input session

- Present slides 3-5 to the participants to provide them with some general background on communication and common barriers to effective communication.
- Hint for the trainer:**
- Use examples of the group exercise for explaining the models and the different aspect. Try to show why it was difficult to re-narrate the exact story.

When implementing a project or realising activities in your community, proper communication is crucial. To qualify internal communication, we need to understand how communication works and its barriers. This is aided by two commonly used models of communication, which are briefly presented below.

### The sender-message-channel-receiver (SMCR) model of communication

**Figure 42.** The sender-message-channel-receiver (SMCR) model of communication



### Shannon-Weaver's Model of Communication

Source: <https://www.communicationtheory.org/shannon-and-weaver-model-of-communication/>

The sender-message-channel-receiver (SMCR) model of communication provides an overview of the various components in the communication process and how they are interlinked with each other. By understanding the dependence of the different components, the participants will understand how communication works and what might disrupt the communication process. The model can be applied to different fields of communication including the general components (starting from the left):

- **Sender:** the originator of message (example: the women farmer A)
- **Encoder:** the transmitter which converts the message into signals (the way message is changed into signals, for example sound waves) (example: the voice of a women).
- **Channel:** the signal carrier or medium (example: voice carried through air).
- **Decoder:** the reception place of the signal which converts signals into message. Decoding is done by the receiver when he gets the message (example: a message gets to a second's woman's ear = listening)



- **Receiver:** the recipient of the message from the sender (example: a second women). She usually gives feedback to the sender in order to make sure that the message was properly received.
- **Noise:** affects the communication process going through the channel and makes the message more difficult to understand by the receiver (example: thunder or crowd noise).
- **Feedback:** The receiver can get an inaccurate message. This is why feedback from the receiver is important in case the message is not properly received. Furthermore, the noise can also affect the decoding of the message by the receiver. (example: a smile of the second women to the first women or any verbal replication)

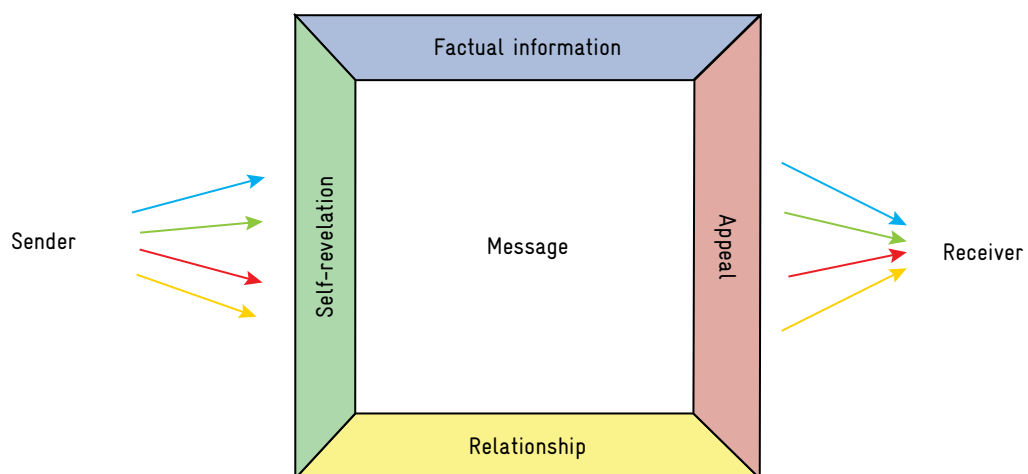
#### 4 sides of communication model (Schulz von Thun) (slide 5)

A second important model of communication that helps participants to create a functioning communication strategy is the four-sides model of communication designed by the German Friedemann Schulz von Thun. It shows how the analysis of a message from a sender by a receiver (see model above) is influenced by different aspects, which can quickly lead to misunderstandings.

The model says that every message has four facets, though not the same emphasis might be put on each: the factual, self-revealing, relationship and appeal facet. A message (communication) can therefore be sent as well as received as one of the four sides of information. Therefore, it is important while coping with internal communication to consider this part of communication which also could be culturally influenced.

- The **Factual Level** contains statements which are matter of fact like data and facts, which are part of the news.
- In the **self-revealing** or self-disclosure, the speaker - conscious or not intended - tells something about himself, his motives, values, emotions etc.
- In the **Relationship**-layer is expressed resp. received, how the sender gets along with the receiver and what they think of them.
- The **Appeal** contains the desire, advice, instruction and effects that the speaker is seeking.

Figure 43. 4 sides of communication model (Schulz von Thun)



Source: <https://www.schulz-von-thun.de/>

#### Hint for the trainer:

To better understand the model, present examples to the participants. Use the following video on the IEC strategy used in MGNREGA program.

<https://www.youtube.com/channel/UCIicGPL5tTD23FvCDFOhrOA>

The most known example which Schulz von Thun gave, is the car situation. The front-seat passenger tells the driver: “Hey, the traffic lights are green”. The driver will understand the message, depending on the ear with which he will hear, and therefor will react differently.

- On the factual information facet, he will understand the “**fact**” “*the traffic lights are green*”,
- On the appeal facet he could also understand it as “Come on, drive! .“-”**command**”, On the “**relationship**” facet he could hear a help like “*I want to help you*,”
- On the facet of self-revelation, he hears behind it: *I am in a hurry* the passenger reveals part of himself (**self revelatory**).

The emphasis on the four facets of communication can be meant and understood differently. For example, the sender might intend to emphasise the attractiveness of the statement and the receiver might mainly receive the relationship part of the message.

### Examples of barriers to effective communication (slide 6)

The four-sides model describes one of the main reasons for misunderstandings. There are many other reasons why interpersonal communications may fail. In many cases, such as described in the example explaining the 4-sides model, the message may not be received exactly the way the sender intended. It is therefore, recommended that the sender actively listens, reflects and checks whether its message has been understood and to be aware of common reasons for misleading communication.

### Common barriers to effective communication (Drexel University 2018):

- **Dissatisfaction or disinterest with one’s job** – when there is dissatisfaction involved it is a big barrier to clear communication and creates likely conflict.
- **Inability to listen to others** – For a fluent communication it’s not only important to know how to communicate but also how to listen.
- **Lack of transparency and trust** – Without trust or transparency especially internal communication is very difficult.
- **Communication styles (when they differ)** - Everyone has their own communication style. Some people are very direct while others prefer a more indirect approach.
- **Conflicts in the Workplace** – when there is a conflict with a person, that difficult or impossible the communication, because it is influenced by a negative feeling.
- **Cultural differences & language** – Communications depends on one’s culture and language. A German person at greeting shakes hands, saying “hi”. An Indian person would close the hands in front of their breast and bow, saying “namaste”.

### Group exercise: Develop your internal communication strategy (slide 7-9)

Time: 15 min.

After understanding how communication works and what barriers can be encountered, in this exercise participants will create an internal communication strategy. They will analyse what, how, why and with whom to communicate internally and discuss how to prevent possible risks. When communicating internally, we have to consider that communication is a very complex process keeping the different facets and barriers of communication in mind.



**Examples:**

Why (here: in the context of adaptation projects)	How (Channel)	What (Message)	Whom (Receiver of the message)
<ul style="list-style-type: none"> <li>• to increase internal knowledge about CCA measures/strategy (awareness raising)</li> <li>• to improve internal work processes</li> <li>• to build capacity and ownership for implementation (support, engagement and participation)</li> <li>• to generate ideas for the development and improvement of CCA strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Written text (paper, email, note)</li> <li>• Phone call</li> <li>• Message on the cellphone</li> <li>• Email</li> <li>• Information night</li> <li>• Group discussion</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Internal processes</li> <li>• Assign to-dos</li> <li>• Ideas</li> <li>• Presenting recent results, processes of the CCA project</li> <li>• emotions</li> <li>• Desires</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Groupmembers</li> <li>• People of different hierarchy</li> <li>• Stakeholders (local/national level)</li> <li>• Different age and gender groups</li> <li>• ...</li> </ul>

- Ask the participants to form groups and reflect about the communication that is happening within their organisations, groups or daily life. By doing so they should analyse the different levels of communication including social, technical and content aspects by using worksheet 1 in handout 6.1 (you will find an example below)
- Guiding questions:
  - What do you communicate about?
  - Who is involved in what kind of communication?
  - How do you communicate and how you wish that communication works?
  - Who is responsible?
- In the second step, engage the participants to analyse whether and what problems or difficulties they experienced in this communication and suggestions to improve it. To help participants brainstorm, remind them of the 4 sides model presented earlier and the examples of barriers to communication.

**Hints for the trainer**

- This exercise will build the basis for the next group work on creating an internal communication strategy.

**Example:**

INTERNAL COMMUNICATION STRATEGY					
Why do we communicate?	What do we communicate about? (Message)	Who is communicating (Sender of the message / responsible person)	How do we communicate? (Channels)	To whom do we communicate? (Receiver of the message)	Experienced difficulties in communication Suggestions to improving communication
Example: Work among farmers must be coordinated with each other	Example: defining daily routine	Example: One famer woman	Example: phone call	Example: Close colleague	Example: at certain times there is no signal and the phone is dead

## Step 2. Developing an external communication strategy

In this Step, the participants will learn how external communication works, what to consider and how they can develop their own strategy for their groups and working teams.

### Input presentation

- Present slides 10-12 (presentation 6.1: develop a communication strategy) to the participants.

External communication is the way you communicate your project activities to the public, stakeholder that are not part of your organisation/team such as: community, investors, political authorities and non-governmental organisations. Other people from the region could for instance be interested in replicating successful implemented CCA measures as they could face the same climate risks. In order to successfully communicate to external stakeholders, it is important to design the communication stakeholder-specific since different stakeholders do have different levels of knowledge, expectations and interests.

External communication aims at:

- Promoting the success of implementation efforts and acquire a pioneer status
- Increasing project's visibility
- Increasing the project's impact
- Improving external reputation towards diverse external stakeholders
- Triggering collaboration in adaptation efforts, e.g., on cluster level, in cooperation with communities, supporting programmes by governments, etc.

### Input: Storytelling - How to perform external communication (slide 10-12)

**What:** Storytelling is the recital of an event or a series of events which can be either true or fictitious. With storytelling you create a more vivid message which the reader can relate to, get involved and feel empathy with the topic. It is a good tool for your external communication. This tool can be especially effective in cultures that have a rich oral tradition.

Examples: The story of ...

- a woman whose life changes through the use of rainwater harvesting
- a little girl and her daily life that was changed by an CCA measure
- a women's self-help group that changed their way of agriculture, adapting it to an CC adapted agroforest system.

### Group exercise (optional, if time allows)

If you have time, you can choose one of forms for telling stories presented below and practise story telling with the group.

#### Forms of story-telling:

- **Sharing Stories:** Ask participants to reflect upon a specific topic, and share stories about that topic from their own personal experience. This may contribute to participants' motivation to deeply engage with a particular topic, as they will be grounded in their own experiences and memories.
- **Critical incidents:** Tell or read a story to the group, and then lead a discussion about the issues raised in the story. You might use an existing parable or local story, or create a story to illustrate the topic you want to address.



- **Finish the Story:** Begin a story, and ask participants to add a line or two. This works best in a smaller group, and can even be used as a quick and fun warm-up.

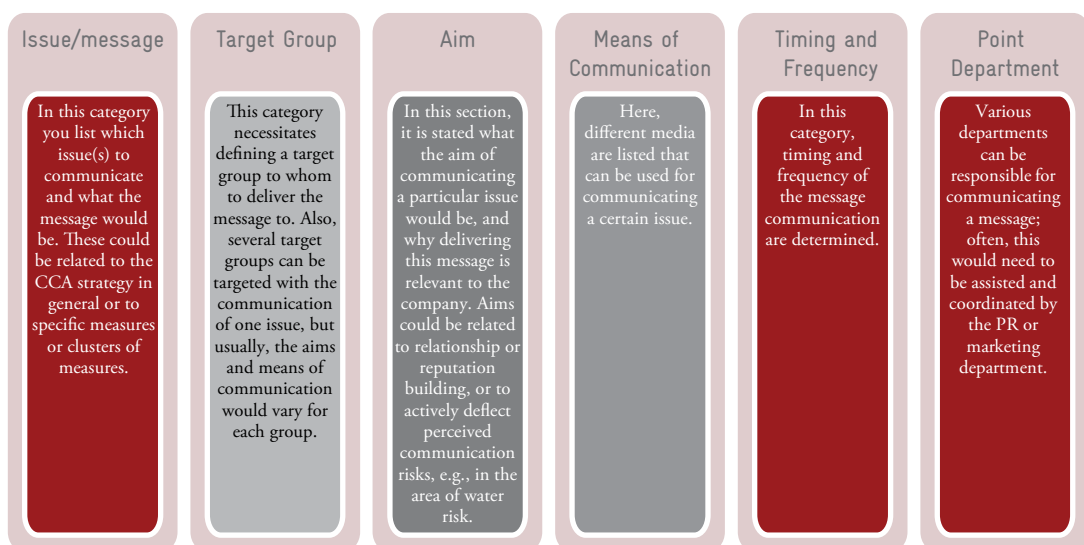
**Group exercise: Channels used for external communication (slide 13)**

Time: 15 min.

- For this exercise you can use a flip chart to collect and present the results to the group or participants can work on the provided worksheet 2 of handout 6.1
- Ask the participants to think about strength and limitations of each item quoted in the table below
- Engage them to talk about their experiences with different communication channels and to present and discuss their own experiences

Communication channels	Strength	Limitations
Video	Example: The video shows a situation or project with images and voice, so it transmits very well what you want to show/communicate, no literacy necessary.	Example: Usually more work required for realisation (incl. technical equipment), requires a medium for transmission (television, internet, computer, telephone etc.)
Flyer	Examples from participants ...	
Painted pictures (walls)		
Audio spot or music		
Little manuals		
Article in the local newspaper		
Webpage		
Newsletter		
Let participants add further channels you know and which are relevant for your daily life and working context		
...		

**Input: Channels used for external communication (slide 14)**



## Group work: Create your external communication strategy (slide 15)

Time: 30 min

- Use worksheet 3 in handout 6.1 and start to create an external communication strategy.
- Find some at least three important messages of you CCA project that you want to communicate and fill in the table.

### Hints

- Inform the participants that this exercise serves for their understanding and application of the learned, but that they can just start within this workshop on selected examples and should conclude afterwards.

External communication					
Issue / Message	Target group	Aim	Means of communication	Timing / frequency	Point department
<b>Example:</b> Rainwater harvesting can be a good method for every women farmer of the village	Women farmers of the village	Make the CCA measure more famous to improve farming conditions in the village	Create a little audio and pass it in the village radio	Once a day for 2 weeks	Responsible for communication and technician.
Ideas of participants					
...					

### Step 3. Using social media

In this step the participants reflect about the use of social media for external communication and practise on a simple example.

#### Input presentation

- Present slides 16-18 (presentation 6.1: develop a communication strategy) to the participants.

Social media is the fastest and newest way to communicate what you do. It is used a lot in private communication, but organisations, politicians and companies also use it. Social media is famous and people like to use it, mainly because it is easily accessible. But remember, not everyone has access to a mobile phone or a computer and the internet. Therefore, access is sometimes limited. A good analysis should be made to consider the way social media is used in each context.

Social media are easy to use, they are fast in transmitting information and they are cheap and have a great impact.

<ul style="list-style-type: none"> <li>■ <b>Benefit:</b> The benefit of the social media is that you can use a lot of pictures, little text and therefor achieve also people who are little literate. You don't need to be a good writer.</li> </ul>	<p><b>Examples of social media (slide 17)</b></p> <p>These are the most common social media used around the world.</p> <ul style="list-style-type: none"> <li>■ Facebook</li> <li>■ YouTube</li> <li>■ WhatsApp</li> <li>■ Instagram</li> <li>■ ...</li> </ul>
<ul style="list-style-type: none"> <li>■ <b>Limitation:</b> Access to internet necessary, few information can be transmitted, needs continuous updates for not losing the interest of the followers.</li> </ul>	



Task for discussion and exchange: Ask what social media do the participants use and why? Ask them to count their experience. The trainer also should take some examples.

### **Final exercise: Post on social media about our session today (slide 18)**

- Engage each participant to create a small post for a social media of their choice about what was learned today or about a great experience.
- If there are people who don't have a cell-phone, they should group up with others.
- If possible, everybody publishes the post and if wished get connected with the other participants.

#### **Hints**

- The participants should think about to whom they want to communicate.
- Explain why they use the medium you decided on.

#### **Hint for the trainer:**

- This task also provides insights into what the participants have learned from the session.

### **Useful literature and databases**

- GIZ: Toolkit to develop climate adaptation strategies for small and medium-sized enterprises (SMEs): Climate Expert. Available at: <https://www.climate-expert.org/en/home/>
- Schulz von Thun Institut für Kommunikation. Communication models. Available at: <https://www.schulz-von-thun.de/die-modelle>

### **Key take-aways**

- Understanding the importance and also the difficulties of communication
- Know what is internal and external communication
- Have the knowledge to create an internal and external communication strategy
- Be aware of the possibilities of social media in the context of CCA

### **Questions for the debriefing phase**

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- Do you know how and do you plan to apply the key concepts provided by this session to your work?
- How did the tool support you in improving acceptance and public visibility of your project activities?



## Module 7. O&M and Sustainability Measures

<b>Learning objective</b>	To learn key concepts that help sustain adaptation projects
<b>Duration</b>	Shortest version: 1 h 30 min Complete version: 4 h 30 min

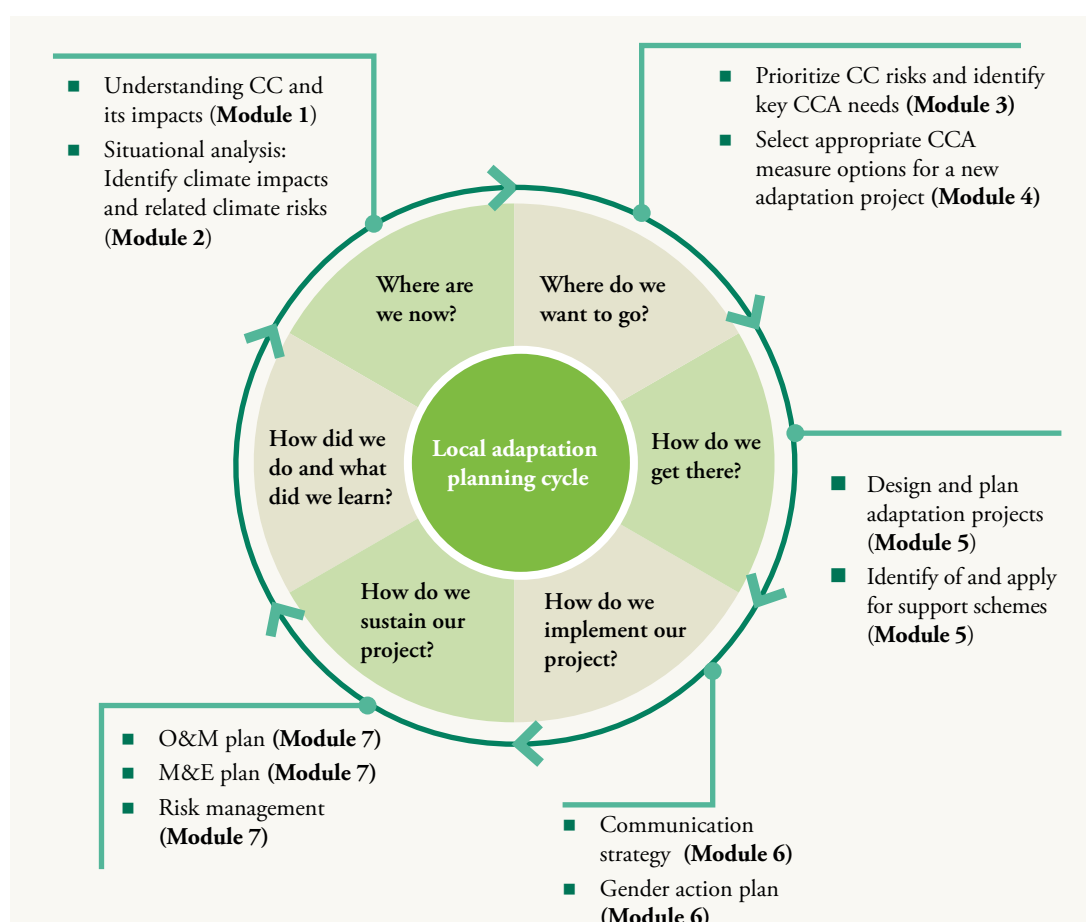
### Module planner

Duration	Sessions of module	Shortest version	Complete version
1 h 30 min	Session 7.1 Operation and maintenance (O&M) plan for environmental infrastructure measures	Step 1 (30 min)	×
1 h 30 min	Session 7.2 Monitoring and evaluation plan	Step 1 (30 min)	×
1 h 30 min	Session 7.3 Risk management	Step 1 (30 min)	×

### Integration of Module 7 along the local adaptation planning cycle

The methodology used by the Capacity Building Package follows the logical processes of local adaptation planning. The figure below shows the arrangement of the modules of the CDP, their main steps and methods employed. The purple colour indicates that you are in Module 7 and Step 7 of the local adaptation planning cycle, which introduces key concepts to PRI-members to increase the sustainability of the project.

In the ExcelTool you will find tabs in the same colours. Here you can document the results achieved by your group of participants in module 7.



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## Session 7.1 Operation and maintenance (O&M) plan for environmental infrastructure measures

<b>Learning objective</b>	Developing a long-term operation and maintenance strategy to ensure that the implemented adaptation measure is sustainable and remain effective.	
<b>Prerequisites / prior knowledge for successful participation</b>	CCA projects are designed and ready to be implemented Note: This session is only applicable for environmental infrastructure measures for climate adaptation including grey and green adaptation measures	
<b>Steps (duration)</b>	<b>Step 1.</b> Understanding the concept of operation and maintenance	30 min
	<b>Step 2.</b> Developing an O&M plan	60 min
<b>Total duration</b>	1 h 30 min (optional: only Step 1 can be trained in 30 min)	
<b>Methods/Exercises</b>	Mind map of benefits and risks, developing an O&M plan including a finance plan based on guiding questions – revise your budget plan	
<b>Material</b>	Beamer, laptop, PowerPoint presentation 7.1, handout 7.1, cards and ability to pin the cards on a wall	
<b>Preparation of the material</b>	You may adapt the case study provided that facilitate the exercises in this session to the context of the participants.	

### Step-by-step approach

The session will provide key important steps to develop an O&M plan for environmental infrastructure measures for climate adaptation.

Where **Step 1** gives a general understanding of operation and maintenance including basic concepts also on sustainability and advantages, in **Step 2**, the participants will put theory in practice and are guided to develop their O&M plan for their adaptation projects. Guiding questions and an illustrative example will provide support. The O&M plan will consider various aspects, from the definition of activities, persons responsible, as well as the necessary budget for O&M implementation, which should be considered in the project's budget plan from the very beginning.

### Entry exercise

- Ask participants to note operation and maintenance activities they now from their daily work on cards
- Collect the cards and pin them on a wall.
- Participants can collect their results using worksheet 1 of handout 7.1.
- Engage each participant to present and shortly explain one activity they noted

This entry exercise will serve as an energiser. Furthermore, the activities collected will give you an insight in the existing knowledge of the participants on O&M.

## Step 1. Understanding the concept of operation and maintenance

### Input session

#### What is O&M?

*“... both a technical activity and a service provision aimed at keeping resource infrastructure at a desired performance capacity or to restoring it to a particular capacity.”*

*It is a service supplied to the providers of the infrastructure and/or to those who deliver certain goods by means of this infrastructure.”*

*Source: MAINTAIN Programme of GTZ*

- Operation refers to the activities that keep a system running smoothly in order to generate certain outcomes.

**Maintenance** refers to the activities required to sustain the adaptation measure in a proper working condition. This not only includes to high system reliability and extended equipment life, but also various non-technical factors must be considered, such as the involvement of stakeholders in the maintenance process, management of the financial resources required for the improvement efforts, etc.

#### **Maintenance approaches:**

- **Preventive maintenance** (ideal scenario) - Work that is planned and carried out on a regular basis to maintain and keep the system in good condition
- **Corrective maintenance** - Replacing or repairing something that was done incorrectly or that needs to be changed as it can be foreseen that without correction the system will not work efficiently or even stop working; an example is the exchange of a leaking pipe or replacement of a wrongly dimensioned pump
- **Reactive maintenance** – emergency responses to unplanned breakdowns

O&M plans are primarily developed and especially relevant for grey adaptation measures (technologies).

### **Why is O&M important for your project?**

Developing an operation and maintenance (O&M) plan is one pillar to ensure sustainability and long-term effectivity of your adaptation project and its objectives. Even the best and most suitable technology can only work if it is operated properly and maintained according to specifications. Many projects have nice ideas, good investments and a successful first implementation phase, but then fail after the financier and the implementing company have left. A common reason for this is a lack of O&M of the implemented measure.

#### **Advantages**

- O&M activities ensure that the project is sustainable in a long-term
- O&M allow for the correct provision of services and benefit of end-users
- O&M prevent the systems to collapse creating environmental and health hazards
- O&M in time with little costs prevent high costs for bigger repairs or replacements
- Community can be involved in O&M

#### **A system is said to have achieved sustainability when:**

- functioning and being used
- able to deliver an appropriate level of benefits (related to quality, quantity, comfort, continuity, affordability)
- continues over a prolonged period of time (beyond the life cycle of the equipment)
- Institutionally managed
- O&M costs are reliably covered (e.g. through user fees)
- mainly operated and maintained at local level
- no negative effect on the environment



### Group task: Mindmap of benefits and risks

Time: 10 min

- Divide the participants into 2 groups
- Ask the first group to brainstorm about what are the benefits of an O&M plan
- Ask the second group to brainstorm about possible risks of a project (without O&M plan) for their adaptation projects
- Realize a mindmap of the two aspects and analyse the results with the participants. You will observe that some risks of the project can be benefits of the O&M Plan.
- Participants can collect their results on worksheet 2 of handout 7.1.

### Step 2. Developing an O&M plan

#### Case study: Examples of O&M plans

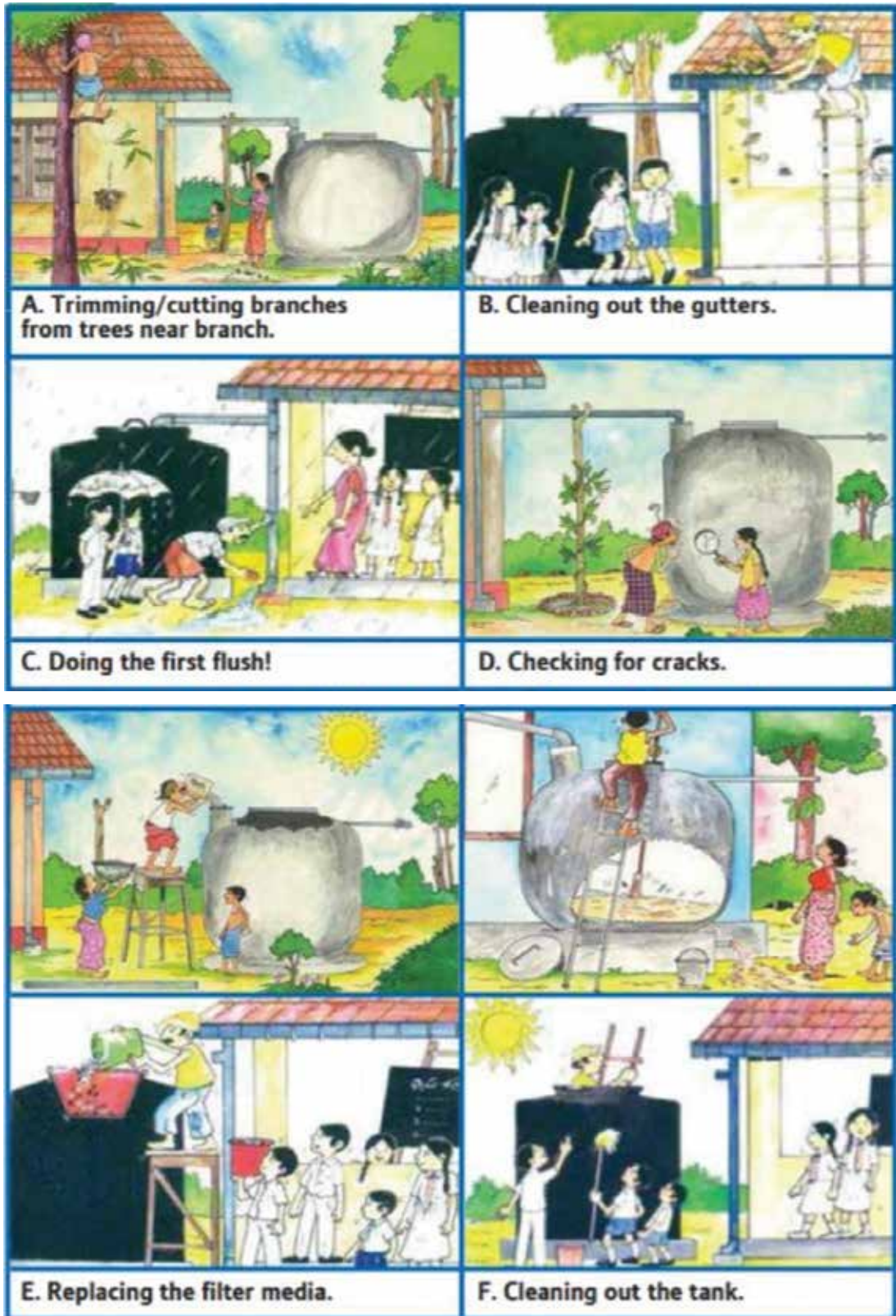
**Roof rainwater** harvesting has high potential in areas that receive higher rainfall and have a longer rainy season and dry periods which need to be overcome with the collected water. Roof top water harvesting is the simplest, less expensive and obvious choice to collect water, where there are several and large roof structures. Rainwater harvesting is useful for many purposes, e.g. in areas where water clean resources are scarce, groundwater is either difficult to extract or has become unusable due to poor groundwater quality, e.g. due to salinity problems, or in areas where only contaminated surface water is available. In order to operate rooftop rainwater harvesting sustainably and efficiently, operation and maintenance activities are crucial. These include for example: Regular inspection and cleaning of catchment, gutters, filters and tanks in order to reduce the likelihood of water contamination. Furthermore, water from other sources should not be mixed with that in the tank.

#### Hint for the trainer:

- The following illustrations are useful to help participants understand important O&M activities for rainwater harvesting rooftop systems.



Figure 44. Exemplary operation and maintenance measures for a rainwater harvesting system



Source: Pacific Community 2020: <http://ccprojects.gsd.spc.int/wp-content/uploads/2020/09/OPERATION-AND-MAINTENANCE-OF-RAINWATER-HARVESTING-SYSTEMS.pdf>

The table below shows an exemplary O&M plan for rainwater harvesting including important O&M activities for different infrastructure components, as well as information on how often and by whom these activities are carried out.

**Hint for the trainer**

- Use this exemplary O&M plan to prepare the participants for the next exercise, where they will develop an O&M plan for their adaptation projects.

**Exemplary operation and maintenance (O&M) plan for rainwater harvesting systems**

Component	O&M activities	Frequency	Person responsible
Roof	Remove all over hanging branches above the catchment surface When required. Replacement of catchments (roofing iron) when holes and rust are visible on it. Cleaning of the catchments (roofing iron) of leaves, moss, bird debris, bird droppings or abandoned nests. If using water, divert runoff by opening the first flush device.	When required, at least 3 times a year, prior to every wet season	Care Taker
Gutters/ Leaf eaters	Cleaning of the gutters and Leaf Eaters of the debris carried by the water from the rooftop (catchment) like leaves and other material possibly clogging the gutters. If using water, divert runoff by opening the first flush device.	At least 3 times a year, prior to every wet season	Care Taker
First Flush Device	Remove plug manually to drain first flush water and replace it securely.	After each rain event	Care Taker
Flap Valve	Make sure the mozzie stoppa flap valve (overflow outlet) is closed properly to avoid insect entering into the storage tank.	After each rain event	Care Taker
Storage Tank	The tank access hole must be covered properly and all light excluded to prevent growth of algae and other organisms in the tank. Clean tank by going inside the tank and clean any silt/sediment.	After each rain event and strong wind, prior to every wet season  At least 2 to 3 times a year,  Repair leaks at elbow/joints when required	Care Taker



## Participatory exercise: Develop an O&M plan for your adaptation project

Time: 40 min

- Ask the participants to analyse their adaptation measure using worksheet 3 in handout 7.1 (see also table below) and to design an operation and maintenance plan by using a four-step approach:
- **First step:** Define the components: Of what components is your measure composed of?
- **Second step:** Analyse and define what O&M activities are necessary to operate and maintain the infrastructure measure
- **Third step:** Define the timetable: when is the action to be realised or may it be a returning activity and on what frequency it must be implemented?
- **Fourth step:** Who is responsible for each identified O&M activity? Should there perhaps be a person employed just for that task?
- The next exercise will look at the costs of defined O&M activities.

### Hints for the trainer:

- Advise the group to be very specific in their answers and to use the guiding questions given below.

Operation and maintenance plan for _____			
Component	O&M activities	Timetable/ Frequency	Person responsible

### Guiding questions for identifying components and O&M activities:

- What are the environmental infrastructural facilities provided?
- What will be the basic operation mechanism?
- What are the Do's & Don'ts for successful operation of the facility?
- What risks do you see in its failure and how can this be prevented?
- What is the maintenance regime to be followed?
- What material/financial means as well as technical expertise are necessary for O&M activities?

### Guiding questions for identifying persons responsible for O&M activities:

- Who is owning the infrastructure?
- Who knows best how the infrastructure works?
- Who is going to monitor the functioning of the pilot?
- Who will/can carry out which task/activity?
- When, how and by whom should a relevant person/agency be approached for O&M?
- What difficulties might arise from hiring a particular person or agency?
- What kind of decision-making bodies should be involved in this process to avoid misappropriation of resources?
- What roles should be assigned for monitoring of construction, record maintenance, user charges, book keeping, punishments, regular cleaning and maintenance.



## Exercise: Determine how the defined O&M activities can be financed - Revise your budget plan!

Time: 15 min

- Projects often fail to operate sustainably because the financing of O&M activities was not considered in the budget planning. With the aim of preventing this mistake, this exercise asks participants to identify any additional O&M costs that may arise and to include these in their budget plan.
- Define exactly the costs: e.g. How much energy is necessary (costs)? Is there an additional salary? Do you need additional material for O&M? Do you need additional installations? (you find more guiding questions which should be answered by the participants below)
- Ask the participants to go back to the budget plan of their adaptation projects and to include the identified additional costs.

### Guiding Questions for O&M financing:

- Should new bodies be established in addition to the Panchayats, SHG, VDCs?
- Should there be non-beneficiaries in this committee to restrain the behaviour of the beneficiaries?
- Are there government schemes providing funds for O&M? Can you decide on user fees for financing O&M? Is the community willing to pay the amount allocated?
- What aspects of the O&M process has costs, how often occur these costs?

### Key take-aways

- Preventive Maintenance is better than responsive maintenance
- Have capacities in place who know how to operate and maintain the infrastructure
- Agree to and document clear responsibilities for O&M
- Raise awareness and train your staff on potential O&M problems and solutions
- Integrate local population benefiting or being affected by your measures through all project phases and give them certain responsibilities to increase ownership
- Develop your O&M plan before the project starts
- Updated your O&M plan continuously and adapted to changing external conditions (climate change, etc.).
- Include time and money for conducting O&M activities when planning finances for your project

### Useful literature and databases

- Central Public Health & Environment Engineering Organisation:
  - Manual on Operation and Maintenance of Water Supply System (2005): <http://cpheeo.gov.in/cms/manual-on-operation--and-maintenance-of-water-supply-system-2005.php>
  - Manual on Storm Water Drainage Systems (2019): <http://cpheeo.gov.in/cms/manual-on-storm-water-drainage-systems---2019.php>
- Ministry of Urban Development, Water Supply and Drainage (2015): Manual for Operation and Maintenance of Rainwater Harvesting System in Schools in Sri Lanka: [http://nwsdbrws.org/downloads/RWS\\_in\\_Schools\\_Eng.pdf](http://nwsdbrws.org/downloads/RWS_in_Schools_Eng.pdf)

### Debriefing questions

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- Do you know how to apply the key concepts to your work?

## Session 7.2 Monitoring and evaluation plan

<b>Learning objective</b>	Understanding and developing a monitoring and evaluation plan for the climate change adaptation projects of women farmers. The plan will help to verify whether objectives are being achieved and to support early adjustments in the implementation whenever necessary.	
<b>Prerequisites / prior knowledge for successful participation</b>	A first design for the adaptation project has been created (Modul 5)	
<b>Steps (duration)</b>	<b>Step 1.</b> Understanding the concept of Monitoring and Evaluation	(30 min)
	<b>Step 2.</b> Define the results chain and indicators	(30 min)
	<b>Step 3.</b> Define means of verification	(30 min)
<b>Total duration</b>	1 h 30 min (optional: only Step 1 can be trained in 30 min)	
<b>Methods/Exercises</b>	Input presentation, determining prior knowledge of the group, puzzle the results chain, define monitoring indicators and means of verification	
<b>Material</b>	Beamer, laptop, PowerPoint presentation 7.2, handout 7.2, moderation cards, wall to pin cards	
<b>Preparation of the material</b>	You may adapt the examples provided to facilitate the exercises in this session to the context of the participants.	

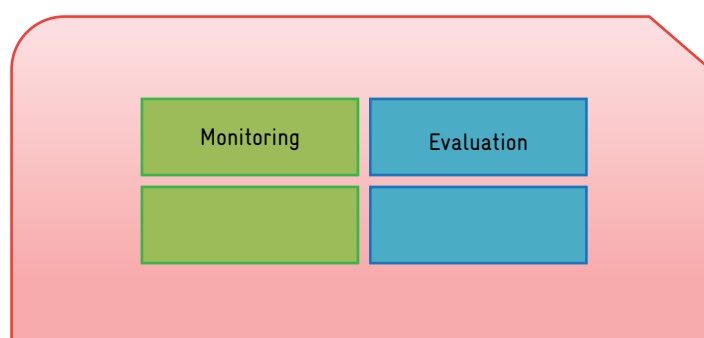
### Step-by-step approach

This module guides women farmers step by step through the preparation of a monitoring and evaluation (M&E) plan. After learning more about the general concept of monitoring and evaluation in **Step 1**, participants will be guided in defining monitoring indicators (**Step 2**) and means of verification (**Step 3**) for their own adaptation project to put theory into practice. In each step, an example from a fictional case study will illustrate the concepts.

### Step 1. Understanding the concept of monitoring and evaluation

**Entry exercise:** Determine the level of knowledge of the participants

[image to explain the task]



### Input presentation

- Present slides 3-4 (presentation 7.2: Monitoring and evaluation) to the participants.



**Monitoring and Evaluation in the Project Cycle** - Monitoring and Evaluation are part of the cycle of your project. The graphic above shows this cycle and where what process is performed. You design your project and implement it. During implementation you realise the monitoring, at mid term and the end of a project the evaluation takes place, using your monitoring as support. Based on the results of the evaluation you adapt your project.

**Monitoring:** it's a continuous process to analyse if you are on the right way with your activities. Monitoring is performed constantly (for example in monthly or semesterly session) and orientates you if you need to change or adapt actions or activities help achieving the desired output, outcome and impact. In projects of climate change adaption, you monitor how and if exposed elements by climate change better adapts to the changes and risks.

*“Monitoring is the systematic and continuous collection of information that enables stakeholders to check whether an intervention is on track or achieving set objectives.”*  
(GIZ 2015: 8)

**Evaluation:** it's performed on a defined moment analysing the state of the whole project at a given moment (in the middle or end of the project) and it's impact.

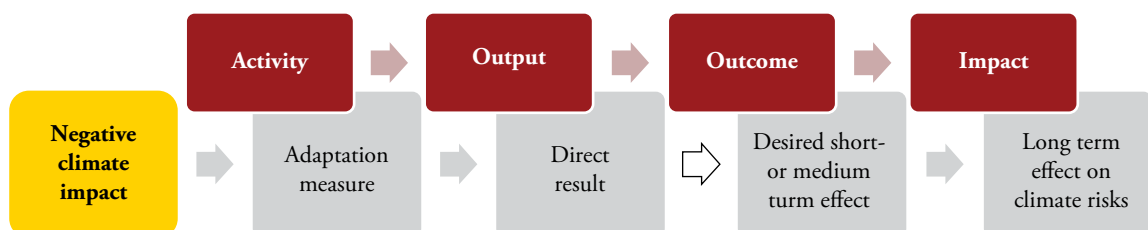
*“Evaluation is a systematic assessment of the worth or utility of an intervention at a specific point in time, for example whether a policy has been effective in achieving set objectives.”*  
(GIZ 2015: 8)

## Step 2. Defining the results chain and indicators

*Note: Parts of this step have already been done in Session 5.1. If the participants have already defined their results chain for their adaptation project, they can proceed directly to the definition of the indicators.*

### Input presentation: Results chain

- Present slides 5-6 (presentation 7.2: Monitoring and evaluation) to the participants.



*A results chain represents the theory of change in a project in terms of a series of boxes, as shown below. It represents a chain of impacts on your project.*

The results chain of a project consists of the following steps:

**Activity:** how the project through proposed measures intends to achieve the different results.

**Output:** what the activities aim to achieve is also called it's direct result

**Outcome:** the effect of an intervention's output, what the project intends to accomplish. In the logic of the result chain, the outcome is the actual goal of a project

**Impact:** the long-term effects produced by the intervention of CCA, what the outcome aims for, you cannot directly influence the impact, only indirectly

### Energizer: Puzzle the results chain (slide 6)

Time: 10 min

An active exercise will help participants to better understand and memorise the results chain of a project.

- Divide the participants in groups of three persons
- Write the result chain and the descriptions below on eight cards as presented in slide 5 (Activity, Output, Outcome, Impact, Adaptation measure, Direct result, Desired short-or medium-term effects, Long-term effects) and hand them over to the participants (hidden)
- The trainer explains that the group has to form the results chain in the right way, on to the aspect and under it it's explanation, the objective is to be fastest.
- On a signal all the groups start and the first group that finishes should yell and present their result, sticking it to the wall.

### Case study (slide 7)

Climate-Change-Related impacts on Agricultural Production and Food Security

CONTEXT	OBJECTIVE	MEASURES
An Increase of extreme rainfall events, interspersed with periods of drought, is causing erosion of arable soil and frequent flooding events. The temperature Increase also impacts agricultural productivity. Food insecurity and poverty are linked to production patters, Income, disaster exposure, education and other conditions, Water availability Is negatively associated with pover	The proposed measure targets rain-dependent farming families. The objective of the project is to secure community livelihoods and food security against climate-change-induced rainfall variability.	Develop household food securIt build resilient livelihoods and institutional capacity in local and regional service delivery to reduce risks through climate change. E.g.: <ul style="list-style-type: none"><li>• Rainwater harvesting sistem</li><li>• Capacity building through training</li><li>• Localy adapted agrolorestry systems</li></ul>

Present a local case study to help participants put the theory presented into practice. This case study will be used to illustrate the next steps. You can use the suggested example or choose one that better suits the actual group of participants.

### Group exercise: Define your results chain (slide 8) (15 min)

- Present the result chain of the case study to the participants to support their understanding of the exercise
- Now ask the participants to define the results chain of their adaptation projects using worksheet 2 in the handout and to discuss their results in small groups
- Facilitate the group's discussions and help formulating output, outcome and impact of the adaptation projects if needed

### Input presentation: SMART Indicators (slide 9)

**Indicators** are used in your project concept and results chain to perform the monitoring and help you understand if you achieved the Output and Outcome intended and therefor the impact of your project. To formulate the indicators, you need to take into consideration that they have to represent



in a way your result that you can measure it. To facilitate the formulation of the indicators we represent the concept of **SMART Indicators**.

**S – Specific** - A specific indicator will be narrowly defined, and will describe exactly what needs to be measured.

**M – Measurable** - A measurable indicator is one which can be aligned with a specific numeric or ranked value to show improvement over time, generally the value is given in countable numbers or percentage.

**A – Achievable** - Defining your indicators for milestones which are realistically achievable is important and also in ensuring that during the conceptualisation phases, the project exists within the realm of what is actually possible to achieve.

**R – Reasonable Ensuring** indicators are relevant provides for a consideration of the context in which the project is operating.

**T – Timebound** - Finally, time-bound is the aspect that include a date by which you expect to see the change, giving substance and life to the project as a whole.

*Examples for climate change adaptation-indicators:*

**Table 9:** Example Outcome Indicators for EbA Interventions

Six Dimensions of Human Well-being	Example Outcome Indicators for EbA Interventions
Assets	Damage to infrastructure during extreme weather events including: <ul style="list-style-type: none"> <li>■ % of hospitals or schools damaged;</li> <li>■ % of houses damaged;</li> <li>■ % of km of roads damaged;</li> <li>■ % of protected areas damaged;</li> <li>■ % of ports damaged;</li> <li>■ % of agricultural land damaged; and/or</li> <li>■ Value from disruption of ecosystem services</li> </ul>
Livelihoods	Income or value of production per household from livelihood activities under changing climate conditions or during extreme events, including from: <ul style="list-style-type: none"> <li>■ Sustainable crop and/or livestock production;</li> <li>■ Sustainable freshwater fisheries and livestock</li> <li>■ Tourism/Ecotourism</li> </ul>
Food Security	<ul style="list-style-type: none"> <li>■ % of people undernourished under changing climate conditions or during extreme events</li> <li>■ Prevalence of moderate or severe food insecurity in the populations, based on the Food Insecurity Experience Scale</li> </ul>
Safety & Security	<ul style="list-style-type: none"> <li>■ % of population with access to reliable, safely managed, affordable drinking water under changing climate conditions or during extreme events</li> <li>■ % of deaths in various demographic groups after extreme events in the affected area</li> </ul>
Health	<ul style="list-style-type: none"> <li>■ Disability-adjusted life years from waterborne diseases after flooding events</li> <li>■ Deaths of various demographic groups from waterborne diseases</li> </ul>



Culture	<ul style="list-style-type: none"> <li>Value of damage to cultural sites and recreation areas under changing climate conditions or during extreme events</li> </ul>
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Source: Conservation international (2017): Submission to SBSTA1 from Conservation International regarding Indicators of Adaptation and Resilience. Available at: [https://unfccc.int/files/parties\\_observers/submissions\\_from\\_observers/application/pdf/911.pdf](https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/911.pdf)

### Group exercise: Define monitoring indicators for your adaptation project (slide 10)

Time: 20 min

- Divide the participants in the same groups as before
- Advise them to use the same adaptation project as before and continue working with their results chain
- Use the worksheet 3 on the handout and try to find one indicator for at least one Output and Outcome of your project, by applying the SMART-framework

	Outcome 1	Indicator
Case Study	The quality of the soil moisture and agriculture in the community garden improved, offering more food stability in the village.	The village can harvest on a weekly bases xy kilo of food from the community field, that contributes 20% of the alimentation of the village.
	Outcome 1	Indicator
Case Study	Daily irrigation of the community field is guaranteed.	With the xy litres of rainwater collected on the school rooftop by the end of each week, the village can irrigate the whole community field on a daily bases for one week, so the plants grow due to their timetable.

### Step 3. Defining means of verifications and assess risk & assumptions

#### Input presentation: Means of verification (slide 11)

The means of verification are documents where it is possible to find the data necessary for evaluating the project.

#### List of exemplary means of verification (not exhaustive):

- Project evaluations: semi-annual and annual reports, midterm and terminal (external) evaluation;
- Context section of current sectoral, regional, and/or national plans and strategies;
- Monitoring programs, GIS data, aerial photos;
- Interviews with relevant officials;
- Information from experts and/or the public;
- Photographs of discussions and interventions;
- Surveys;
- Harvesting lists;
- Field monitoring reports;
- Meeting minutes.



## Group work: Defining means of verification for your adaptation project (slide 12)

Time: 20 min

- Divide the participants in the same groups as before
- Advise them to use the same example as before and continue working with their results chain
- Participants can use worksheet 2 of handout 7.2 and try to find for each indicator identified for the outputs and outcomes means of verification

	Outcome 1	Indicator	Means of verification
Case Study	The quality of the soil moisture and agriculture in the community garden improved, offering more food stability in the village.	The village can harvest on a weekly bases xy kilo of food from the community field, that contributes 20% of the alimentation of the village.	<ul style="list-style-type: none"> <li>■ Field monitoring reports;</li> <li>■ Project evaluations</li> <li>■ Harvesting lists;</li> </ul>
	Outcome 1	Indicator	Means of verification
Case Study	Daily irrigation of the community field is guaranteed.	With the xy litres of rainwater collected on the school rooftop by the end of each week, the village can irrigate the whole community field on a daily bases for one week, so the plants grow due to their timetable.	<ul style="list-style-type: none"> <li>■ Harvesting lists;</li> <li>■ Field monitoring reports;</li> <li>■ Photograph</li> <li>■ Surveys;</li> </ul>

### Benefits of monitoring and evaluation

- Guarantee that you realize the project in the way you intended and wrote it
- Don't forget any necessary step
- Give feedback to the donor
- Stay in track of the line of your project
- Have a proof that you achieved your impacts
- Guarantee sustainability

### Feedback round: What did the participants learn?

- Ask the participants to go back to the initial wall of understanding of monitoring and evaluation and look at the cards they wrote
- If they now see that their understanding changed, they should take the card and write on the back their new understanding
- To guide the feedback round, the debriefing questions at the end of this session will help you

### Useful literature and databases

- GIZ (2015): Developing national adaptation monitoring and evaluation systems: A guidebook. Available at: [https://www.adaptationcommunity.net/?wpfb\\_dl=268](https://www.adaptationcommunity.net/?wpfb_dl=268)
- Organisation for Economic Co-operation and Development (OECD) / Development Assistance Committee (DAC) (2002): Glossary of Key Terms in Evaluation and Results Based

Management. Available at: <https://www.oecd.org/dac/evaluation/2754804.pdf>

- UNESCO: Sustainable Development. Available at: <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd>
- Conservation international (2017): Submission to SBSTA1 from Conservation International regarding Indicators of Adaptation and Resilience. Available at: [https://unfccc.int/files/parties\\_observers/submissions\\_from\\_observers/application/pdf/9111.pdf](https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/9111.pdf)
- Resin. Supporting decision-making for resilient cities. Monitoring and Evaluation. Available at: <http://wiki.resin.itti.com.pl/article/frequently-encountered-challenges/monitoring-and-evaluation/>

### Key take-aways

- M&E Frameworks serve to assess projects and keep track of progress made in dealing with climate change.
- Based on the results chain, the tool applies a tabular format to illustrate the logic of the ensuing indicators and means of verification for the project or programme assessment.
- The tool is a first step in formulating indicators and means of verification to examine and follow the development of a project.
- The session should give the participants a base to work with M&E in daily project contexts of CCA.

### Debriefing questions

- What are your important take-away messages from this tool?
- Which outcomes of the tool do you find most relevant for your work?
- Do you know how to apply the key concepts to your work?
- Did the session help you to better write and apply your project?
- How did the tool support you in establishing an M&E Framework?
- Would you be motivated to use M&E in your daily context to better the quality of your work?



## Session 7.3 Risk management

<b>Learning objective</b>	to identify, prioritize and minimize the likelihood of negative events for your adaptation project	
<b>Prerequisites / prior knowledge for successful participation</b>	A first design for the adaptation project has been created (Modul 5).	
<b>Steps (duration)</b>	<b>Step 1.</b> Risk identification	(30 min)
	<b>Step 2.</b> Risk evaluation	(30 min)
	<b>Step 3.</b> Risk management	(30 min)
<b>Total duration</b>	1 h 30 min (optional: only Step 1 can be trained in 30 min)	
<b>Methods/Exercises</b>	Input presentation, brainstorming of potential risk for adaptation projects, risk evaluation matrix, creating a risk management plan	
<b>Material</b>	Beamer, laptop, PowerPoint presentation 7.3, handout 7.3	
<b>Preparation of the material</b>	You may adapt the examples provided that facilitate the exercises in this session to the context of the participants.	

### Step-by-step approach

When realizing a project, even if you already planned it carefully, there is always the possibility that unexpected problems occur. In this session will be treated the Risk management. Risk management is a very important aspect of the project planning and realization, as it is a continuous process of identifying, analyzing, prioritizing and mitigating risks that threaten a projects likelihood of success in terms of e.g. cost, schedule, quality, safety and technical performance. A well-thought-out plan for managing risks is often one prerequisite for applying for support programmes.

In **Step 1** of this session, the participants will be guided to identify potential risks their adaptation projects could face.

**Step 2** focuses on assessing the risks using forms of prioritization.

**Step 3** finally gives a base how to mitigate risks and provides guidance on developing risk mitigation strategies.

#### Step 1. Risk identification

In this step the focus will be on identifying the risk that can endanger the right implementation of a project. The risks therefor will be divided in the categories internal and external risk (that is one possible method for exploring potential risks).

In this way, it can be distinguished between external risks that stem from outside and internal risks. External risks do not depend on your project, but can influence it and its performance. These risks are negative events in the vaster environment of your project.

Internal risks can e.g. delay organisational processes, project implementation, production etc. and external risks can lead to security issues, increase of costs, public references and demands or block supply chains, etc.

Divided by categories, that could be possible risks:

Internal risks	External risks
<ul style="list-style-type: none"> <li>■ Team (e.g. conflict within the team, lack of trained staff)</li> <li>■ Technical (this includes risks based on requirements, the technology being used, its performance and quality)</li> <li>■ Management (this includes any risks that come up from planning, scheduling, estimating, or communication)</li> <li>■ Organizational (this includes any project dependencies, logistics, resources, budget, etc.)</li> <li>■ Knowledge (e.g. lack of knowledge)</li> <li>■ Financial (e.g. corruption, inability to cover expenditures)</li> <li>■ Operational (e.g. equipment failure)</li> <li>■ ...</li> </ul>	<ul style="list-style-type: none"> <li>■ Political (e.g. change of government, political unrest)</li> <li>■ Economic (e.g. economic crises, inflation)</li> <li>■ Social (e.g. pressing social problems change public preferences)</li> <li>■ Technological (e.g. energy breakdown)</li> <li>■ Legal (e.g. change in legal frameworks, exposure to litigation)</li> <li>■ Environmental (e.g. flooding blocks transportation)</li> <li>■ Financial (e.g. change of exchange rate)</li> <li>■ ...</li> </ul>

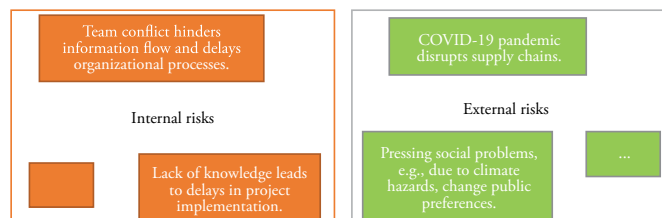
### Group exercise

Time: 10 min

- Ask the participants to brainstorm potential risks that negatively affect the outcomes and outputs of their projects by using the categories above. All ideas of things that can go wrong are welcome at this stage.
- Ask the participants to write their risks on a card and to pin them on the wall you prepared (see visualisation example below).
- Engage the participants to present their cards by describing the risks and possible consequences for their adaptation projects.
- Participants can use worksheet 1 of handout 7.3 to collect their results.
- The risks are assessed and prioritised in Step 2.

#### Hints for the trainer:

- If participants have difficulty identifying potential risks, they shall note down 5 of the most important processes/activities of their project and assign potential risks to them.



### Step 2. Risk evaluation

In the second step of this session, after having identified potential risks, the participants will learn how to evaluate risks. Risk evaluation is about developing an understanding of which potential risks have the greatest possibility of occurring and can have the greatest negative impact on the project.



As not all risks are equal, there has to be made some differentiation in treating them in the prevention and management phase. Some risk events are more likely to happen than others, and have a higher negative impact on the project. Therefore, project teams should focus first on the risks which are more likely to happen and more severe.

### Group exercise

Time: 20 min

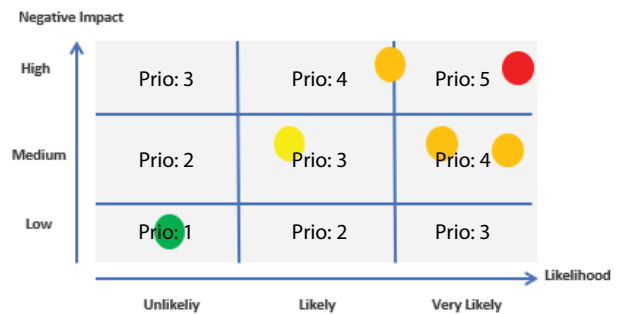
- Ask the participants to go through the list of identified risks and to prioritise them against their likelihood of occurring and magnitude of negative impact on the projects by using the matrix below (worksheet 2 of handout 7.3).
- Ask the participants to assign priority levels between 1-5 to the risks as shown in the matrix below.

#### Hints:

- Define criteria to determine high-impact risks to help focus on a few critical risks that require mitigation (e.g. a risk that increases the project costs by 10% of the initial project budget, is considered a high risk)

#### Guiding questions:

- Is the risk likely to happen?
- Did that kind of risk already happened and is likely to be repeated?
- Has that risk never occurred before?
- Could that risk change your project in a negative way?
- What would be the impact of that risk to your project?

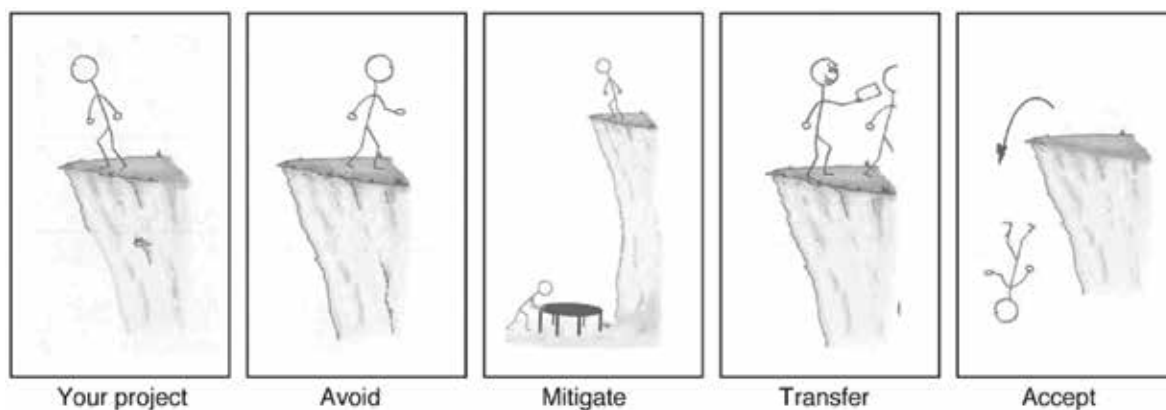


### Step 3. Risk management

In this step participants will design strategies or put measures in place to deal with identified most critical risks in step 2 (very likely and high negative effect expected).

There are different ways to manage risk, also depending on what stage of the process the risk management is integrated. Within the most common ways which can be applied and considered already in the project planning phase is the mitigation. When you don't take the anticipated approaches for risk management there are still the approaches for risk immediate risk management, as avoiding, transferring or accepting the risk.

- **Avoid:** Change your plan to bypass the issue, for example remove the cause of the threat altogether.
- **Mitigate:** Taking preventative action to reduce the probability of risk occurrence or impact on the project - design the project's activities in a way that's already prepared to handle a risk
- **Transfer:** Outsource the risk (or a portion of it) to a different team or agency. Think of this as a typical "insurance" policy.
- **Accept:** Assume the chance of a negative impact or eventually budget in the cost of dealing with it.
  - Preparation (In the event that you accept the possible consequences of a risk, you should know what to do if it actually occurs. In this case, developing an **contingency plan** is recommended. In that situation you are confronted with the question: "What do we do now?")



Source: BCcampus Open Publishing: Risk Management Planning. Available at: <https://opentextbc.ca/projectmanagement/chapter/chapter-16-risk-management-planning-project-management/>

### Group exercise: Manage the risks (slide 10)

Time: 20 min

- Ask the participants to go through the list of key risks identified in Step 2 and to think about potential risk mitigation measures. In each case, they should ask themselves: “How can we minimise the likelihood of the risk occurring or, if it does occur, minimise its impact?”
- The participants can use the table below (worksheet 3 in handout 7.3) to collect their results, whereby the columns “risks” and “consequences” are filled with the results from Step 1 and the columns “probability” and “impact” and “priority” are filled with the results from Step 2.

	Risk	Consequences	Likelihood	Negative impact	Priority (1-5)	Risk management measure
Example 1	External risk: Change of government	Example: The government stops financing your project.	Unlikely	High	3	Accept: Accompany the political developments
Example 2	Internal risk: Conflict in the team	Workflow stops because internal communication is interrupted	Very likely	Medium	4	Prevention: realise regular team meetings with feedback rounds
Your project	...	...	...	...	...	...

### Useful literature

- BCcampus Open Publishing: Risk Management Planning: <https://opentextbc.ca/projectmanagement/chapter/chapter-16-risk-management-planning-project-management/>

### Key take-aways

- Risk management allows to foresee and consequently avoid risky activities in a proactive manner.
- Risk can damage the project, when you don’t consider that there are risks for your project.
- Risk management is an important tool of project design, planning and implementation.
- Risks can stem both from internal and external influences– make sure that participants consider both dimensions and are sanitized that each dimension requires different mitigation strategies.
- Risks vary in terms of severity depending on their level of impact and the likelihood of occurrence – make sure that participants focus on key risks with a high impact and high likelihood with effective mitigation measures, whereas for low impact and low likelihood risks, it can be enough to monitor the risks.



### Debriefing questions

- What are your important take-away messages from this session?
- Which outcomes of the session do you find most relevant for your work?
- How did the session support you in understanding risks related to the project and developing strategies to mitigate these risks?











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