

# Trainer's Guidebook on Integrating Climate Change in Development Planning in Himachal Pradesh





**Trainer's Guidebook**  
**On**  
**Integrating Climate Change in**  
**Development Planning in**  
**Himachal Pradesh**

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# Contents

List of Tables.....	viii
List of Figures.....	ix
Abbreviations.....	xi
<b>1. Introduction to the Guidebook .....</b>	<b>1</b>
1.1 Background.....	1
1.2 Target Group.....	2
1.3 Guidebook Objective.....	3
1.4 Guidebook Design .....	3
1.5 Training Methodology.....	3
1.6 Training Package .....	3
<b>2. Climate Change and Vulnerability and Risks .....</b>	<b>5</b>
2.1 Indian Context.....	5
2.2 Himachal Pradesh.....	6
2.2.1 Profile .....	6
2.2.2 Climate Change Vulnerability and Risks .....	7
2.2.3 Risks of Climate Change .....	10
<b>3. Guidance for Sensitization of State-Level Policymakers .....</b>	<b>13</b>
3.1 Context.....	13
3.2 Introduction to the Training Programme.....	14
3.2.1 Objective.....	14
3.2.2. The Audience.....	15
3.3 Preparation before the Training .....	15
3.4 Training Modules.....	16
Module 1: Recent Developments in Climate Change Science and Policy Paradigm - Global and National .....	16
Module 2: Mapping Climate Risks and Adaptation Needs of the State .....	18
Module 3: Resource Requirement for Integration of Climate Adaptation in State's Plans.....	21
3.5 Training Plan .....	23
<b>4. Guidance for Training of State and District Level Administrations .....</b>	<b>25</b>
4.1 Context.....	25
4.2 Introduction to the Training Programme.....	25
4.2.1 Objective .....	26
4.2.2 The Audience .....	26
4.3 Preparation for the Training .....	26
Step 1: Map Relevant Stakeholders .....	27
Step 2: Develop the Training Plan and Agenda .....	27

Step 3: Identify and Finalize Resource Persons for the Training .....	28
Step 4: Prepare Customized Training Materials .....	28
Step 5: Design and Implement a Feedback Process from Trainees .....	29
4.4 Training Modules .....	29
Module 1: Introductory Activities .....	29
Module 2: Setting Climate Change in the Development Context .....	30
Module 3: Evaluating Climate Change Vulnerabilities and Risks .....	32
Module 4: Field Visit .....	36
Module 5: Identifying and Prioritizing Climate Adaptation Actions .....	36
Module 6: Monitoring and Evaluation of Adaptation Actions .....	37
Module 7: Financing of Climate Adaptation and Preparation of Project Proposals .....	37
4.5 Training Plan .....	38
<b>5. Guidance for Training of Panchayati Raj Institutions at village and block levels .....</b>	<b>39</b>
5.1 Context .....	39
5.2 Introduction to the Training Programme .....	41
5.2.1 Objective .....	42
5.2.2 The Audience .....	42
5.2.3 Focus Areas .....	43
5.2.4 Method of Training .....	44
5.3 Preparation for the Training .....	44
Step 1: Identifying the villages .....	45
Step 2: Identifying the Participants .....	45
Step 3: Ascertaining the Timing .....	45
Step 4: Drafting Agenda .....	45
5.4 Training Modules .....	45
Module 1: Introductory Activities .....	46
Module 2: Setting the Context .....	46
Module 3: Identifying Climate Risks at Gram Panchayat Level .....	47
Module 5: Accessing Resources for Building Climate Resilience at the Community Level .....	50
Module 6: Integrating Gender perspectives into Climate Change Adaptation .....	51
Module 7: Monitoring & Evaluation (M&E) of Climate Adaptation Actions .....	53
5.5 Training Plan .....	53
Annexure 1: Category of decision makers/policy makers for sensitization at state level .....	54
Annexure 2: Mapping departments, mandates, developmental programmes, and programme scopes .....	55
Annexure 3: Agenda of the Training at State/District .....	57

Annexure 4: Training Plans .....	60
PART A .....	60
PART B .....	61
PART C .....	66
Annexure 5: Supporting Literature.....	69
PART A Understanding climate change .....	69
PART B Understanding Vulnerability and Risk.....	71
PART C Climate Change Adaptation .....	75
PART D Climate Change Action in India .....	76
PART E Gender and Climate Change.....	78
PART F Climate Change Adaptation Strategy .....	78
PART G Climate Lens Approach.....	80
PART H Monitoring and Evaluation.....	83
PART I Climate Finance .....	84
PART J Sample Presentation Slides.....	86
Annexure 6: Suggested questions for Panellists participating in Panel discussions.....	88
Annexure 7: Suggested design of the field visit and information to be provided to participants .....	90
Annexure 8: Sample Registration Form and attendance sheet.....	91
Annexure 9: Sample Feed Back Forms.....	92
Annexure 10: Reading List .....	94

## List of Tables

Table 1 : District wise Climate change projections for Himachal Pradesh.....	9
Table 2 : Current and Projected Composite Vulnerability (CV) for Himachal Pradesh .....	9
Table 3: State gender vulnerability matrix for facilitated discussion .....	31
Table 4: Illustrative example of agriculture sector climate risk assessment .....	35
Table 5: Gram Panchayat Planning Time Lines (Ministry of Panchayati Raj, 2018) .....	45
Table 6: Perception on climate change amongst FGD participants.....	47
Table 7: FGD matrix to be used for identifying vulnerability and risk due to climate – example of irrigation systems.....	49
Table 9: Guidance for ascertaining the finance requirement .....	51
Table 10: Decision makers to be trained at Tamil Nadu .....	54
Table 11: List of Climate Adaptation Relevant Departments in Himachal Pradesh .....	55
Table 12: Roles and Responsibilities of the Climate Adaptation Relevant Departments.....	56
Table 13: Complete training plan for State-level Policymakers in Himachal Pradesh .....	60
Table 14: Complete training plan for State and District-level Decision makers in Himachal Pradesh.....	61
Table 15: Complete training plan for Members of Gram Panchayats in Himachal Pradesh.....	66
Table 16: Format for applying the climate lens approach to a PPS.....	81

# List of Figures

Figure 1: Approach for integrating climate change adaptation in development planning .....	2
Figure 2: District wise projections for annual average maximum temperature in Himachal Pradesh.....	7
Figure 3: District wise projections for annual average minimum temperature in Himachal Pradesh.....	8
Figure 4: District wise projections for annual average rainfall in Himachal Pradesh.....	8
Figure 5: District Wise Current and Projected Composite Vulnerability for Himachal Pradesh.....	10
Figure 6: Global Sustainable Development Goal (United Nations, 2016) .....	17
Figure 7: Overview of international climate negotiations (Adopted from Smith School of Enterprise and the Environment, 2011 and UNFCCC) .....	17
Figure 8: Progression of National Policy paradigm on Climate Change .....	18
Figure 9: Risk based approach to adaptation (OECD, 2015).....	21
Figure 10: The three aspects of building climate resilience.....	22
Figure 11: Training preparation steps .....	26
Figure 12: Presentation slide on ‘Goal of the Training Programme’ .....	30
Figure 13: Summary of Change in Projected Climate for Districts of Tamil Nadu .....	33
Figure 14: IPCC AR5 concept on climate risk (IPCC, 2014) .....	34
Figure 15: Gram Panchayat Development Plan (GPDP) preparation cycle and entry point for enabling climate change resilient development planning and implementation.....	41
Figure 16: Training preparation steps.....	44
Figure 17: Training Modules for community level training .....	46
Figure 18: (a) and (b) Examples of action learning for identifying climate vulnerability and Risk .....	48
Figure 19: Integrating gender perspective at project level (GIZ, 2013) .....	52
Figure 20: Changing CO2 concentrations in the atmosphere through the centuries from presentations for training.....	69
Figure 21: Presentation slide on ‘Weather and climate scales’ .....	70
Figure 22: IPCC observation of impacts.....	70
Figure 23: Presentation Slide on ‘Climate Risk’ .....	71
Figure 24: Presentation Slide on ‘Climate Risk and Vulnerability’ .....	71
Figure 24: Presentation Slide on ‘Vulnerability Assessment framework’ .....	72
Figure 25: Presentation Slide on ‘Vulnerability Assessment framework’ .....	72
Figure 26: Presentation Slide on ‘Vulnerability Assessment Tools’ .....	73
Figure 27: Presentation slide on ‘Climate risk categorisation’ .....	74
Figure 28: Presentation Slide on ‘Impacts of Climate Change’ .....	75
Figure 29: Presentation Slide of ‘Global Climate Risk Index 2018’ .....	76
Figure 30: Presentation slide on ‘Adaptation strategy & planning’ .....	78

Figure 31: Presentation Slide on ‘Adaptation gap’ .....	79
Figure 32: Presentation slide on ‘Applying climate lens to development planning’ .....	80
Figure 33: Presentation slide on ‘RKVY Case Study’ .....	81
Figure 34: Presentation slide on ‘Applying climate lens on RKVY’ .....	82
Figure 35: Presentation slide on ‘Adaptation Action Prioritization Process’ .....	82
Figure 36: Presentation slide on ‘M&E Steps’ .....	83
Figure 37: Presentation slide on ‘M&E Indicators’ .....	83
Figure 38: Steps for determining finance requirement .....	84
Figure 39: Presentation slide on ‘Sources of finance’ .....	84
Figure 40: Presentation slide on ‘Climate finance hierarchy’ .....	85
Figure 41: Presentation slide on ‘Funds available at local level’ .....	85
Figure 42: Presentation Slide on ‘Drought, Water Crisis in Himachal Pradesh’ .....	86
Figure 43: Presentation Slide on ‘Rainfall Projections for Himachal Pradesh’ .....	86
Figure 44: Presentation Slide on District Composite Vulnerability in Himachal Pradesh’ .....	87
Figure 45: Presentation Slide on Himachal Pradesh’s Climate Response .....	87

# Abbreviations

Abbreviation	Definition
AfD	Agence Francaise de development
AR5	Fifth Assessment Report
ASHA	Accredited Social Health Activist
AV	Audio Visual
AWW	Anganwadi Workers
BAU	Business as usual
BDO	Block Development Officer
CBT	Climate Budget Tagging
CC	Climate Change
CCA - RAI	Climate Change Adaptation in Rural Areas of India
CFO	Climate Finance Option
CO2	Carbon Dioxide
CRIDA	Central Research Institute for Dryland Agriculture
CSO	Central Statistics Office
CSR	Corporate Social Responsibility
CSS	Centrally Sponsored Scheme
DFID	Department for International Development
EPA	Environmental Protection Agency
EU	European Union
FGD	Focus Group Discussion
G20	Group of Twenty
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GP	Gram Panchayats
GPDP	Gram Panchayat Development Plans
GPPFT	Gram Panchayat Planning Facilitation Team
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
M&E	Monitoring & Evaluation
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MLA	Member of Legislative Assembly
MoEFCC	Ministry of Environment, Forest and Climate Change

MP	Member of Parliament
NAPCC	National Action Plan on Climate Change
NASA	National Aeronautics and Space Administration
NATCOM	National Communication
NCC	National Cadet Corps
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
NORAD	Norwegian Agency for Development Cooperation
NSS	National Service Scheme
OSR	Own -Source Revenue
PES	Payment for Ecosystem Services
PMCCC	Prime Minister's Council on Climate Change
PPS	Policies, Programmes and Schemes
PPT	Power Point Presentation
RCP	Representative Concentration Pathway
SAPCC	State Action Plan on Climate Change
SC	Schedule Caste
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goals
SHG	Self Help Group
ST	Schedule Tribe
TNA	Training Needs Assessment
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations International Children's Emergency Fund
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development



# 1. Introduction to the Guidebook

## 1.1 Background

India's vast population, residing in hills, alluvial plains, desert, plateau's and coastal regions is increasingly becoming vulnerable to rising temperatures and enhanced intensity of extreme events. In response, the Indian government has formulated its National Action Plan on Climate Change (2008) and rolled out eight missions<sup>1</sup> towards making natural resources and human habitats climate resilient<sup>2</sup>. The Missions included in the National Action Plan are:

- National Mission for Sustainable Agriculture,
- National Water Mission
- National Mission for a Green India
- National Mission for Sustaining the Himalayan Ecosystem
- National Habitat Mission
- National Mission on Enhanced Energy Efficiency
- National Solar Mission
- National Mission on Strategic Knowledge for Climate Change

Additionally an action plan on climate change and human health is also available.

Subsequent to the introduction of the NAPCC, the State governments were encouraged to prepare their own State Action Plans on Climate Change (SAPCC) to integrate state-level variations in ecosystems, geographic conditions, socio-economic scenario and other factors convergent with the existing policies and ongoing programmes and schemes implemented at the state level. The states have initiated capacity building actions and demonstration projects to implement SAPCCs.

GIZ, jointly with MoEF&CC has implemented Indo-German technical cooperation project titled 'Climate Change Adaptation in Rural Areas of India – CCA RAI' in 2009 which aimed to enhance the resilience of rural communities towards climate change. The project, in partnership with Department of Environment, Science and Technology, Himachal Pradesh has been supporting capacity development of relevant stakeholders (senior state officials, technical and field officers, early to mid-career scientists, scholars, non-government organizations (NGOs), women Self Help Groups (SHG)) at the state level on Climate Change Adaptation (CCA) planning, implementation, accessing finance and monitoring & evaluation.

1 The other missions on wind, waste to energy and coastal area mission are in the drafting stage.

2 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2822162/>

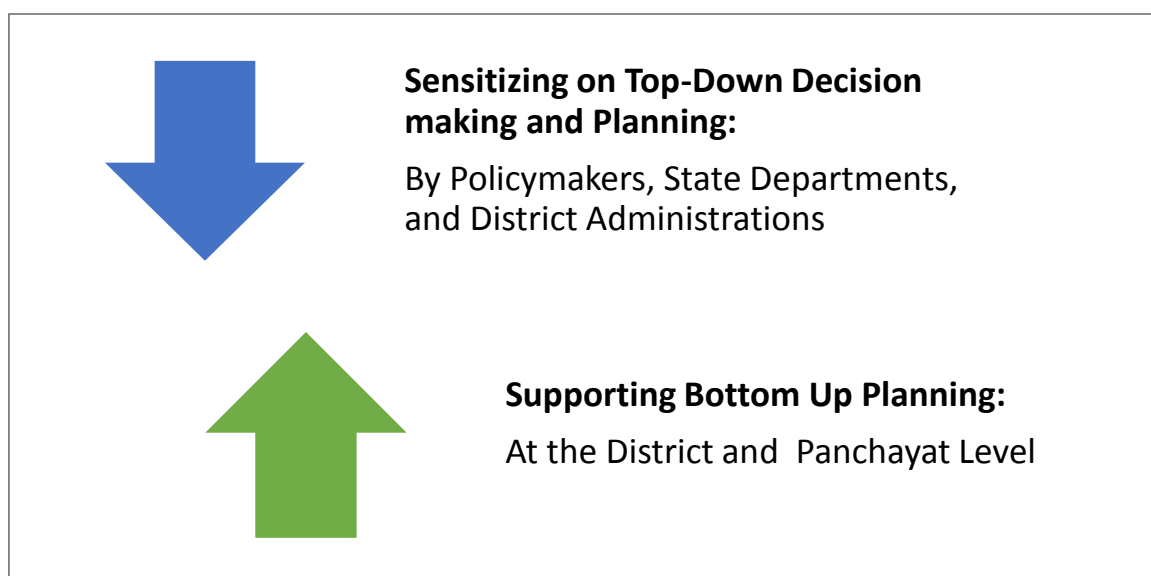
A series of Training Needs Assessments (TNAs) carried out in the State underscored the need for developing a cadre of trainers to support state climate change nodal agencies on capacity building for integrating climate change in development planning, using a standardised approach. A trainer's guidebook could therefore act as a key resource. Based on the guidebook, the state nodal agency on climate change can create a pool of Master Trainers, who in turn can impart training to the concerned stakeholders. This is in line with the mandate of the state nodal climate change agency that is entrusted to build capacities and provide advisories on strategies to address climate change related issues in its respective state.

Himachal Pradesh, a mountainous state in India located in the western part of the Himalayas. It is highly vulnerable to climate change, especially to the increasing trends of extreme events such as cloud bursts, hail storms, land slides, recurrent droughts, erratic snow fall etc. Its rural population, constituting 90% of the total population of the State (GoHP, 2019) is heavily dependent on climate sensitive sectors and is therefore vulnerable to climate change. Integration of climate change adaptation in development planning is therefore the way forward and it can only be achieved when policy makers, decision makers and implementers within the government are aware and take informed decisions to ameliorate the impacts of climate change. Keeping this in view, a Trainer's Guidebook for Integrating Climate Change Adaptation in Development Planning in Himachal Pradesh has been developed as part of the CCA-RAI project in collaboration with the State Centre on Climate Change, Department of Environment, Science and Technology.

## 1.2 Target Group

The guidebook provides systematic guidance on training approach for integrating climate change adaptation in development planning to Trainers who regularly conduct trainings, of decision makers, planners and practitioners involved in sustainable management of natural resources and livelihoods from the State Departments, District Administration, and Panchayati Raj Institutions (PRIs) at village and block levels. It advocates for integration of climate change adaptation through a bottom up planning supported by a top down decision-making process (see Figure 1).

**Figure 1:** Approach for integrating climate change adaptation in development planning



## 1.3 Guidebook Objective

The guidebook aims to:

- Provide guidance to trainers on integrating climate change adaptation planning at different levels of governance with state specific case studies along with examples of field visits and training methodologies.
- Provide easy to use tools, techniques, and methods for conducting trainings on climate adaptation planning, implementation, financing, and monitoring applicable to respective governance level.

## 1.4 Guidebook Design

The chapters of this guidebook are organized as per the key stakeholder group that requires training. Each chapter provides specific guidance to the trainers on:

- The training programme objectives; and understanding of the stakeholders for whom the training has to be designed
- Preparation required for planning the training programme
- The training modules to be covered under the training and resources that can be used by the trainers in developing the content for the trainings and
- The training plan along with the methodology to be used and materials required

## 1.5 Training Methodology

The training programmes are designed to cover a wide-range of tools and techniques for meeting the desired training objectives. A hands-on approach is recommended, for all the trainings in order to actively engage the trainees in identification of climate risks, adaptation actions, financing resources, and Monitoring & Evaluation (M&E) tools.

A wide-range of training resources are provided in Chapters 3, 4 and 5 including presentations, active-learning exercises, case studies, videos and handouts. In addition, several group exercises are included in the training resources to ensure that the trainees understand the real-world applications of the concepts, approaches and techniques covered in the training programme.

## 1.6 Training Package

Training Package includes

- The Trainer's Guidebook providing guidance on how the training needs to be planned and delivered for various levels of governance
- Case study based exercises for various modules and includes all necessary supporting information for completing the exercises.
- A library of PowerPoint presentations with notes that support the input sessions including case studies
- A library of literature to enhance understanding of climate change science, adaptation, and related policies





## 2. Climate Change and Vulnerability and Risks

### 2.1 Indian Context

Climate plays a major role in economic development in India as livelihoods of about 69% of the population residing in rural areas are directly tied to the climate sensitive agriculture and forestry sectors. These two sectors together with mining and quarrying contribute 18.57 percent to the Indian economy (Ministry of Statistics and Programme Implementation, 2019). Changes in climate have impacted water resources availability and soil health and consequently affected agriculture, water, forestry and other dependent livelihoods sectors, all of which have been documented in various publications. Therefore, measuring and understanding climate change trends and projections is important to design adequate adaptation strategies.

Based on IMD observations, it is concluded that temperatures are rising in India. A report published by IITM (IITM, 2017) indicates that by 2016 the annual mean, maximum, and minimum temperatures, averaged over the country as a whole, showed significant warming trend of 0.16, 0.17, and 0.14°C per decade, respectively, since 1981. Maximum warming trend is seen during the post-monsoon season. The annual as well as seasonal (June through September) monsoon rainfall over India show a significant decreasing trend over the core monsoon zone as well as the north-eastern parts and southern parts of west coast. The total number of consecutive dry days with spell length more than five days has increased significantly, while the total number of consecutive wet days have decreased significantly.

The future projections of climate change till 2100, based on six simulations with IITM-RegCM4 RCM and ten simulations with SMHI-RCA4 RCM for RCP2.6, RCP4.5, and RCP8.5 scenarios (Krishnan & Sanjay, 2017), indicate that

- All India mean surface air temperature change, relative to 1976–2005, is projected to increase by a minimum of 1.08°C to a maximum of 1.44°C by mid-century
- All India mean surface air temperature change, relative to 1976–2005, is projected to increase by a minimum of 1.12°C to a maximum of 4.65°C by end century
- The semi-arid north-west and north India will likely warm more rapidly than all India mean.
- Monthly increase in all India mean surface air temperature is relatively higher during winter months than in the summer monsoon months throughout the 21st century under the three RCP scenarios
- Substantial changes in temperature extremes are projected over India by 2100, with a likely overall decrease in the number of cold days and nights and an increase in the number of warm days and nights.
- All India annual precipitation is found to increase as temperature increases, though precipitation changes throughout the 21st century remain highly uncertain.

- All India annual precipitation extremes are projected to increase as well but uncertainty levels are high.
- The downscaled projections suggest that intensification of both dry and wet seasons is expected along the west coast of India and in the adjoining peninsular region.

#### Box 1: Description of RCPs

Representative Concentration Pathways (RCPs) are trajectories of greenhouse gas concentration in the atmosphere adopted by the IPCC for its 5th AR. There are four concentration pathways based on four different global developmental paradigms, represented by RCP2.6, RCP4.5, RCP6.0, and RCP8.5. Each of the numbers next to the RCPs, represent the radiative forcing in the year 2100. Concentrations corresponding to RCP8.5 will happen if development is entirely based on thermal intensive energy. However, depending on penetration of low carbon technologies including renewable technologies and carbon capture and storage into the economy the concentrations can correspond to RCP2.6 to RCP6.0 (IPCC, 2014). The Table below indicates the typical characteristics of the RCPs as modelled by IPCC and accepted worldwide.

RCP	Radiative Forcing (W/m <sup>2</sup> ) by 2100	CO <sub>2</sub> -e (PPM)	Temperature rise projected by 2100 (°C)	Pathway
RCP8.5	8.5	1370	4.9	Rising
RCP6.0	6.0	850	3.0	Stabilization without overshoot
RCP4.5	4.5	650	2.4	Stabilization without overshoot
RCP2.6	2.6	490	1.5	Peak and decline

The following sections present specific profiles, climate trends and an assessment of vulnerabilities due to climate change in Himachal Pradesh.

## 2.2 Himachal Pradesh

### 2.2.1 Profile

Himachal Pradesh is a Himalayan state in the northern part of India. The state is surrounded by Jammu and Kashmir in the north, Punjab in the west and the south-west, Haryana in the south, Uttar Pradesh in the south-east and China on the east. It covers an area of 55,673 sq. km. According to the 2011 census its population was around 6.9 million. The state is divided into 12 districts and has 3,243 Gram Panchayats. The five rivers, the mountainous terrain, and the forest cover of 51,100 sq. km (Forest Survey of India, 2017) of the State has shaped the economy of Himachal Pradesh.

It is one of the fastest growing states in India. At current prices, the Gross State Domestic Product of Himachal Pradesh reached Rs 1,36,000 crores (US\$ 21.13 billion) in 2017-18. The State's per capita GSDP in 2017-18 was Rs 1,86,777.57 (US\$ 2,898.02). GSDP increased at a Compound Annual Growth Rate of 11.02 per cent between 2011-12 and 2017-18. The tertiary sector witnessed the fastest growth at a CAGR of 12.43 per cent between 2011-12 and 2017-18 (Government of Himachal Pradesh, 2019).

As of November 2018, the total installed power generation capacity in Himachal Pradesh is 4,046.81 MW.

With a hydro power potential of 18,820 MW (of which 9,755 MW has been harnessed), Himachal Pradesh accounts for 25.9 per cent of the country's total hydro power potential (Government of Himachal Pradesh, 2019). Every village of Himachal Pradesh is electrified.

Agriculture is a major source of employment for the rural population in Himachal Pradesh. With suitable agro-climatic conditions, Himachal Pradesh has realised the importance of commercial crops and diversified into multiple varieties including apples and off-season vegetables, potatoes and ginger. The state has emerged as the leading producer of horticulture produce. In 2017-18 the production was estimated at about 2.4 million tonnes (Rathore, Attri, & Jaswal, 2013).

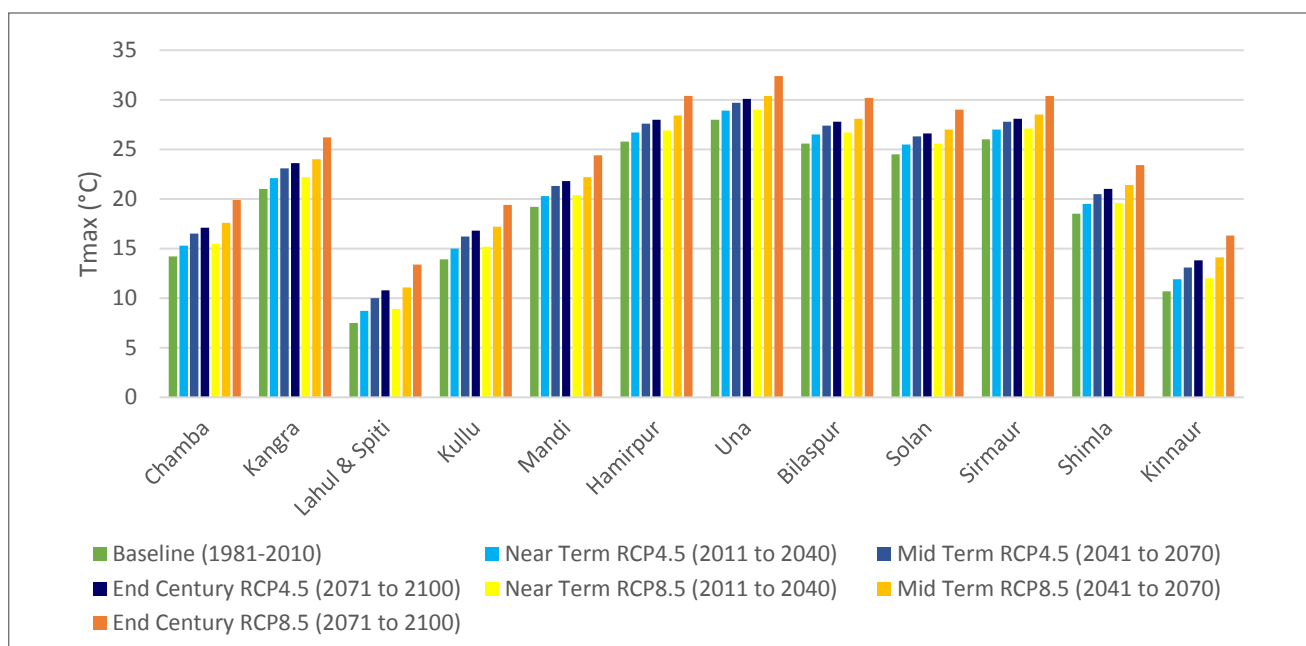
The tourism sector generates considerable livelihoods, and is dependent on natural resources. It contributes 6.6 per cent to the State's GDP. Domestic tourist inflow in the state reached 19.13 million in 2017, while foreign tourist arrivals reached 470,992.

### 2.2.2 Climate Change Vulnerability and Risks

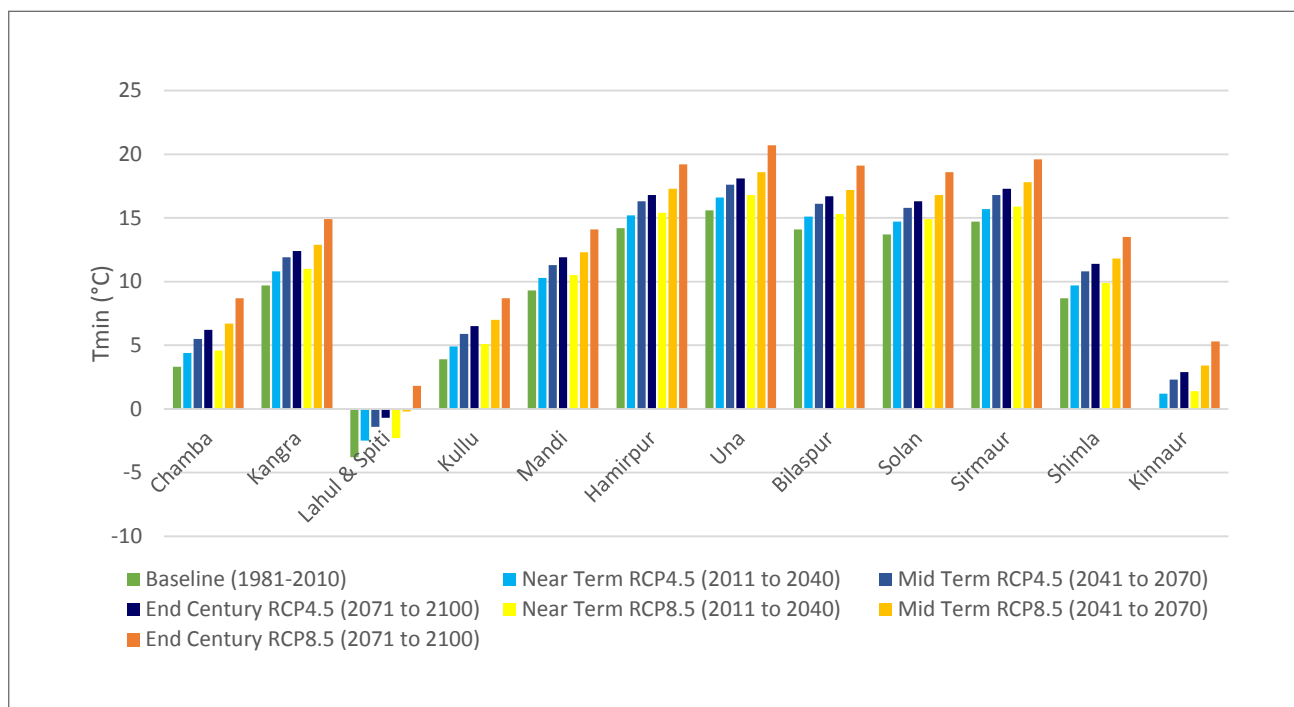
According to the report titled "State Level Climate Change Trends in India" by the India Meteorological Department (Rathore, Attri, & Jaswal, 2013), the annual mean maximum temperature is rising at the rate  $+0.06^{\circ}\text{C}/\text{year}$ . The annual mean minimum temperature is decreasing at the rate of  $-0.01^{\circ}\text{C}/\text{year}$ . In addition, the annual rainfall trends in the state have been decreasing by 3.26 mm per year.

The climate projections made for near (2011-2040), medium (2041-2070), and long term (2071-2100) w.r.t base line (1981-2010) for the State of Himachal Pradesh (DEST and GIZ, 2018) indicate that the annual mean maximum temperature in the State may rise by up to 2.5 to  $5^{\circ}\text{C}$  by end century under RCP4.5 and RCP8.5 scenarios, respectively. Lahul & Spiti district is projected to be the worst hit by rising temperatures. The baseline average minimum temperature in the district is  $-3.8^{\circ}\text{C}$  and predicted to increase by 3.1 and  $5.6^{\circ}\text{C}$  under RCP4.5 and RCP8.5 scenarios, respectively, by the end of the century. Precipitation in the state may increase by a maximum of 14% by 2100 under both RCP4.5 and 8.5 considerations. District wise details are provided in Figures 2, 3, and 4 and Table 1 provides a state summary.

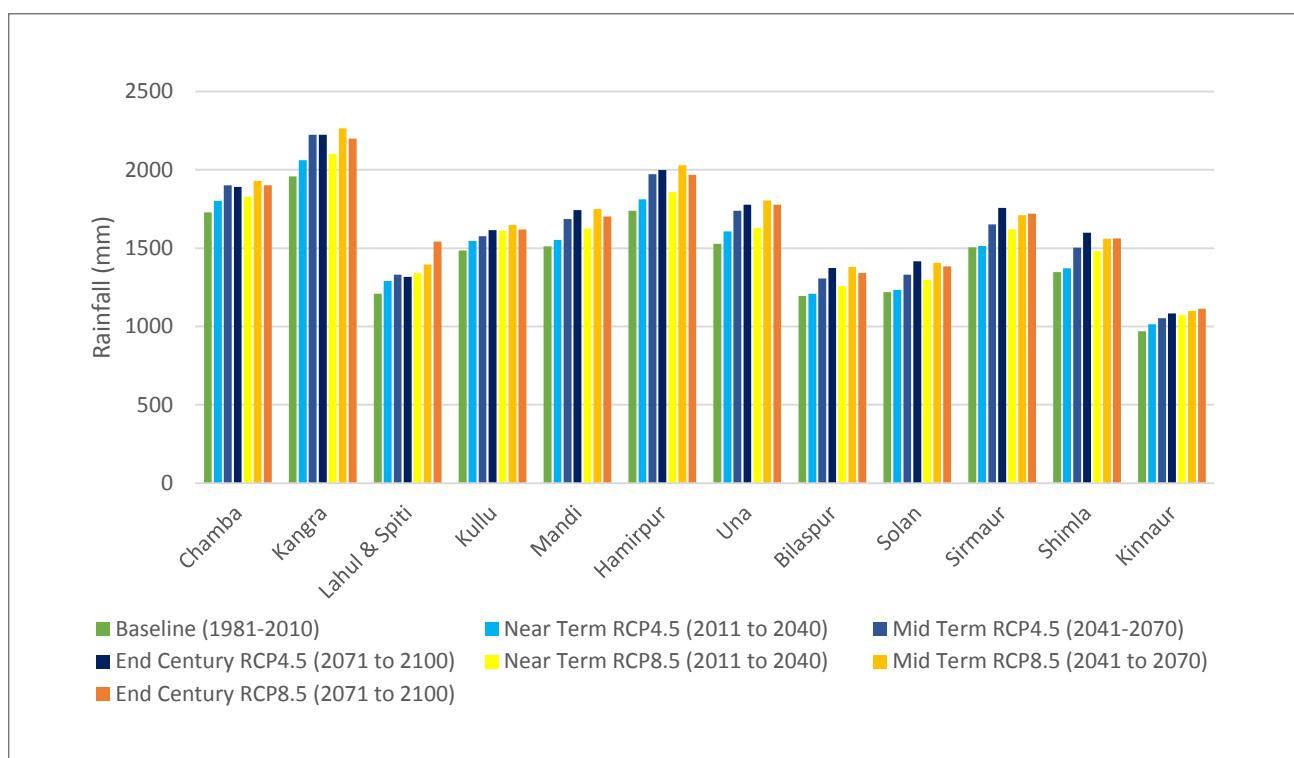
**Figure 2:** District wise projections for annual average maximum temperature in Himachal Pradesh



**Figure 3:** District wise projections for annual average minimum temperature in Himachal Pradesh



**Figure 4:** District wise projections for annual average rainfall in Himachal Pradesh



**Table 1 :** District wise Climate change projections for Himachal Pradesh

Time frame	Temperature Changes	Precipitation Changes	Extreme Events
<b>2011-2040 (Near Term)</b>	Tmax: 1.04°C and 1.18°C Tmin: 1.05°C and 1.26°C under RCP4.5 and 8.5 respectively	Increase by 3.46% and 7.58% under RCP4.5 and 8.5	Heavy rainfall, heat waves, floods and drought are likely to increase in future and will become increasingly important and will play a more significant role in disaster management.
<b>2041-2070 (Mid Term)</b>	Tmax: 2.05°C and 2.95°C Tmin: 2.13°C and 3.18°C under RCP4.5 and 8.5 respectively	10.57% and 14.78% increase under RCP4.5 and RCP8.5, respectively.	
<b>2071-2100 (Long Term/ End Century)</b>	Tmax: 2.55°C and 5.04°C Tmin: 2.7°C and 5.07°C under RCP4.5 and 8.5	Increase by 13.77% and 14.30% under RCP4.5 and 8.5, respectively	

Source: (DEST and GIZ, 2018)

As the economy of Himachal Pradesh is significantly dependent climate-sensitive sectors such as agriculture, horticulture, and forestry, climate change can have an adverse impact on the state's development trajectory.

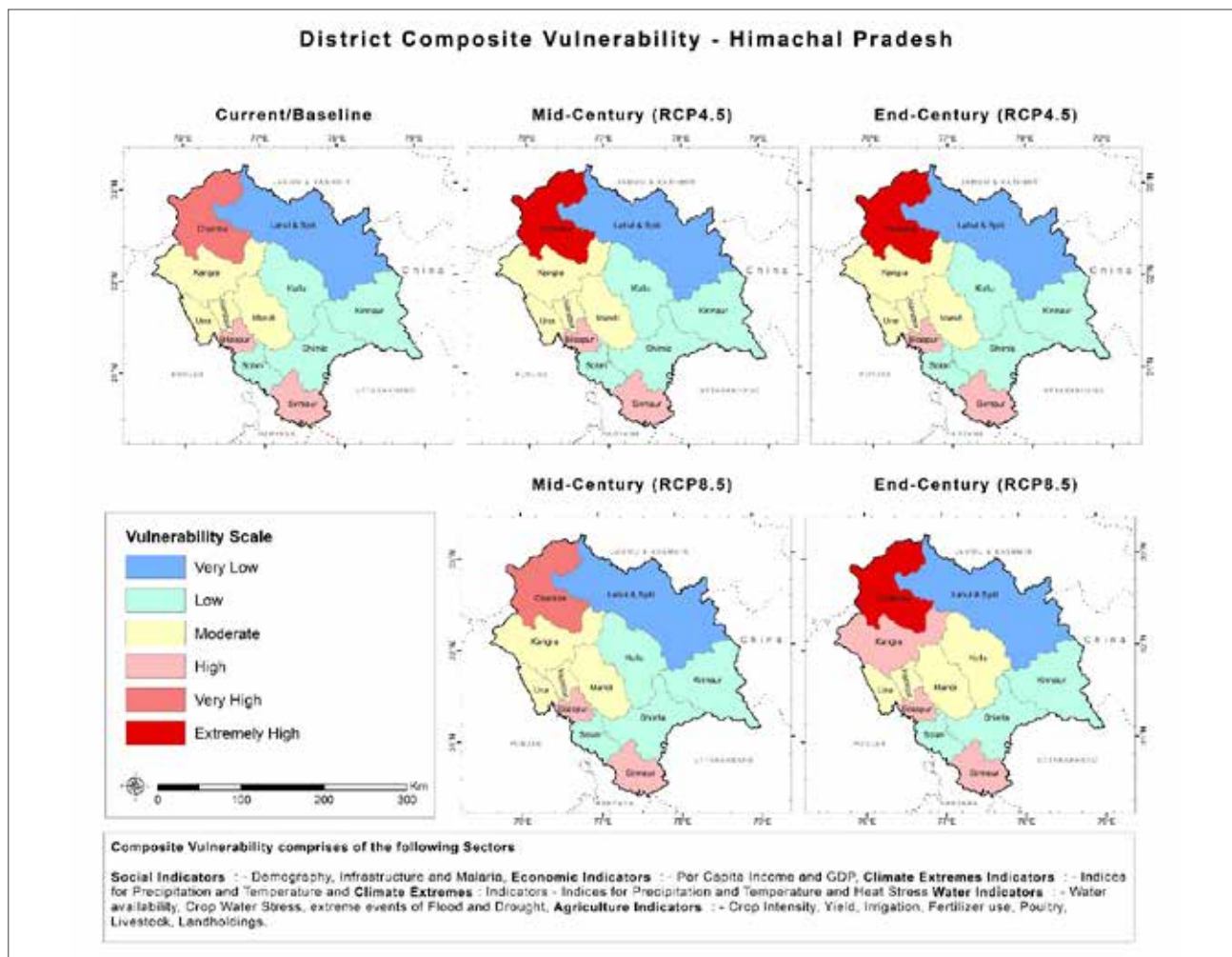
The Composite Vulnerability for the state has been evaluated on the basis of its exposure, sensitivity to climate change (on-going and projections) and adaptive capacity (DEST and GIZ, 2018). These are defined in terms of climate observations and projections, its socio-economic status and extent of natural resource availability including sensitivity of the natural resources to climate change. Table 2 and Figure 5 below map the Composite Vulnerability Index of districts in Himachal Pradesh for the current (1981-2010), mid-century (2021-2050) and end-century (2071-2100) timelines (DEST and GIZ, 2018).

**Table 2 :** Current and Projected Composite Vulnerability (CV) for Himachal Pradesh

Districts	Baseline		RCP 4.5		RCP 8.5	
	Rank	Baseline CV	Mid-Century CV	End Century CV	Mid-Century CV	End Century CV
<b>Lahul &amp; Spiti</b>	1	VL	VL	VL	VL	VL
<b>Kinnaur</b>	2	L	L	L	L	L
<b>Solan</b>	3	L	L	L	L	L
<b>Kullu</b>	4	L	L	L	L	M
<b>Shimla</b>	5	L	L	L	L	L
<b>Hamirpur</b>	6	M	M	M	M	M
<b>Mandi</b>	7	M	M	M	M	M
<b>Kangra</b>	8	M	M	M	M	H
<b>Una</b>	9	M	M	M	M	M
<b>Bilaspur</b>	10	H	H	H	H	H
<b>Sirmaur</b>	11	H	H	H	H	H
<b>Chamba</b>	12	VH	EH	EH	VH	EH

VL: Very Low, L: Low, M: Moderate, H: High, VH: Very High, EH: Extremely High

**Figure 5:** District Wise Current and Projected Composite Vulnerability for Himachal Pradesh



The composite vulnerability assessment using RCP 4.5 scenario indicates that for mid and end century, the district of Chamba is likely to transition from the current very high vulnerability status to extreme vulnerable situation by mid-century. For RCP 8.5 runs, however, Chamba remains at very high vulnerable status even at mid-century and only moves to extreme vulnerable status at the end century. Additionally, in this scenario, the district of Kullu shows a transition from a low vulnerable status to a moderate vulnerable status by the end century. Clearly indicating that appropriate adaptation actions need to set in to avert reduce the vulnerabilities.

Exposure to rainfall variability, extremely wet days, consecutive wet days, consecutive dry days, flood discharge, drought weeks and sensitivity to heat stress, seasonal crop water stress are projected to increase towards the mid-century and end-century as compared to current conditions; thus, contributing to increase in overall Composite Vulnerability (CV).

### 2.2.3 Risks of Climate Change

The IPCC AR5 (IPCC, 2014), brings in the concept of risk, that needs to be taken into account as well in addition to vulnerability, in climate change adaptation planning and management. The AR5 glossary defines climate risk as the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends

occur. It is often referred to as the likelihood of occurrence of adverse impacts on lives, livelihoods, health of ecosystems and species, economic impacts, social and cultural assets, services (including environmental services) and infrastructure.

Given its location within the Himalayas, Himachal Pradesh is one of the most hydro-meteorological hazard prone areas in India. Recent reports indicate erratic and increased intensity of extreme rain fall including cloudbursts, hail storms, flash floods, landslides, glacial lake outburst floods (GLOFs), interspersed with extended periods of droughts etc. The intensities and frequencies of these events are likely to escalate in the future as per the climate projections. These bring in a risk of enhanced soil erosion, land degradation, adverse effect on the food security, damage to roads and other communication infrastructure, loss of livelihoods, increase in disease burden, lower hydropower production amongst others. The policy makers and planners thus need to take into account the enhanced risks due to climate change, and proactively devise and implement adaptation plans to prepare and avert the consequent impacts.





## 3. Guidance for Sensitization of State-Level Policymakers

### 3.1 Context

Climate Change Adaptation (CCA) requires anticipatory action and a change of mind-set that goes beyond the integration of additional knowledge. In addition, CCA action needs to be undertaken despite considerable uncertainty in the risks due to climate change. Potentially conflicting objectives, e.g. achieving poverty reduction while being consistent with adaptation and a low carbon economy, need to be reconciled. These are implications that might detain high-level decision makers from taking proactive action if they do not fully understand the need and urgency of engaging in CCA activities. For many it is still a new topic and often comes on top of other pressing developing needs. Many high-level decision-makers lack a thorough understanding of possible climate change impacts and climate change adaptation and how adaptation can go hand in hand with development planning and progress. Thus, in order to promote CCA action, high-level decision makers need to be sensitized and convinced about the need for action.

Globally, temperature is rising unequivocally, precipitation is becoming more erratic with increase in heavy precipitation events, cyclone intensities are increasing, and the sea levels are rising (IPCC, 2013). At the state level, the challenges and opportunities to policymakers raised by climate change are wide-ranging and its implications for society are substantial (Adopted from Smith School of Enterprise and the Environment, 2011 and UNFCCC). Some of the key developmental concerns associated with climate change that are of importance to a policymaker are:

- **Food and nutritional security** – Changing climatic patterns will affect various dimensions of food security and nutrition such as food availability, access, utilization and stability of food systems. Further, the long-term changes on the extent and intensity of the Indian Monsoon will affect cropping patterns across the country.
- **Water security** – Changing precipitation patterns coupled with increasing population will deeply affect the water security situation in the country. According to data by the Ministry of Water Resources, Government of India, the average annual per capita water availability in India has declined by 15% to 1,545 cubic meters between 2001 and 2011 (Ministry of Water Resources, 2017). It is projected to reduce further to 1,341 and 1,140 in the years 2025 and 2050, respectively. Annual per capita water availability of less than 1,700 cubic meters is considered as water stressed condition, whereas annual per capita water availability below 1,000 cubic meters is considered as a water scarcity condition.
- **Human wellbeing** – Changing climate is known to impact human health directly or indirectly, thus affecting productivity. Studies indicate that vector borne diseases such as malaria have spread in places which did not offer climate windows for the related vectors to proliferate. Further, it is projected that endemicity may shift from current endemic areas to other areas in India (Bhattacharya, Sharma, & Dhiman, 2006). Further, incidences of heat stress related diseases, water borne diseases, mental

health etc. are projected to rise as climate changes in India (Bush, Luber, & Hu, 2011).

- **Sustainable livelihood and development** – In India, a majority of the population still depends on climate sensitive sectors such as agriculture and natural resources for their livelihood and economic sustenance. Ensuring sustainable livelihood options for these vulnerable populations and meeting the country's developmental goals remains a key concern for all policy makers.
- **Sustainability of high value infrastructure** – Infrastructure such as transport, electricity grids, communication, buildings, dams, ports etc. are critical for modern day living. This high value infrastructure is susceptible to the extremities of climate change. Policies and regulations that allow for building climate resilient infrastructure need to be in place.
- **Avert climate migration** – Extreme weather events like heavy precipitation events, intense cyclones, droughts and tropical storms are becoming a norm. As a result large scale population, that are economically backward, living in areas affected by such incidences (for example, recurring North East floods, floods in Mumbai in 2005 and again in 2017, floods in Kerala, recurrent droughts in western and southern Indian regions, Chennai flood in 2015, Vardah cyclone in 2016 and Gaja cyclone in 2018) are becoming climate migrants. Within India, about 1.5 million people are classified to be internally migrated from rural to urban centres to escape the devastation caused by such events (Sharalya, 2018). Further, trans-border migration from neighbouring countries is also becoming a norm (World Bank, 2018).

Awareness on climate sensitivity of systems is important, as well as the knowledge on the extent of vulnerability and risks for making informed decisions. This programme is designed to facilitate this knowledge sharing with policy makers within a state who have a crucial role to play in charting the development trajectory of their administered region. By preparing for a changing climate, policymakers can better protect communities, businesses and natural assets.

## 3.2 Introduction to the Training Programme

The following subsections outline the objective of the training programme and the audience or key stakeholder(s) for whom these trainings need to be organized. Subsequently the next sections will cover:

- **Preparation for the Training:** This section will detail out the research and planning that will have to be undertaken by the trainer to design such a programme for policymakers.
- **Training Modules:** This section describes the various modules and their content to be covered under the programme.
- **Training Plan:** This section provides the recommended training plan which covers information on the modules and sessions to be carried out along with the timing of each session, their objectives, methodology to be used and materials required.

### 3.2.1 Objective

The programme for high-level policy/decision makers will aim to:

- Communicate the need and urgency to respond to the threats and opportunities posed by climate change through integrating climate change adaptation in all government planning processes.
- Build understanding on the policies and actions required to facilitate climate change adaptation within

a policy maker's area of governance.

- Communicate the existence of various climate finance windows including international and national options (GCF, NAFCC etc.) and role they can play in leverage finance for climate actions from various government schemes
- Communicate capacity building requirements for building climate resilience

### 3.2.2. The Audience

The key stakeholders for this programme will be the policy makers at various levels of governance in the State. They would include:

- Decision Makers at the State level:
  - These could be political leaders and top bureaucrats at the state level including Ministers, Members of Parliament, Members of Legislative Assembly, the Chief Secretary, Principal Secretaries of various departments in the State that are relevant for climate change adaptation covering the areas of planning, finance and programme implementation. A list of these stakeholders is provided in Annexure 1.
- Decision makers at the District Level:
  - These could be political leaders and bureaucratic heads at a district level including district commissioners or district collectors.

## 3.3 Preparation before the Training

To begin planning for the training programme, the trainers will first need to map the policy makers at the state and district levels. This process will enable a better understanding of the existing governance structure in the state as well as the roles and responsibilities of the various policy makers identified in relation to climate change adaptation planning.

Subsequently, the trainer will coordinate with the climate change focal point in the state responsible for organizing the training and support writing of the following:

- Background for the training
- About the training – the training modules, their objectives, how they will be conducted and duration of the training,
- List the policy makers to be targeted for training
- Agenda of the training programme

While preparing the background note of the training programme, the trainer together with the nodal CC cell should have completed a detailed research in order to contextualize the focus of the training on:

- How the development at national and state levels is impacted by climate change
- The need for integrating climate change in planning at the state or district level
- How the policy makers invited for the training programme will benefit from it and the specific role that they can play in supporting climate change adaptation in their respective areas of governance.

This programme should be ideally designed for up to 3 hrs.

Trainers can also refer to resources in Annexure 5 (parts A, B, C, and D) for further understanding the climate change context for the following training modules.

### 3.4 Training Modules

Prior to commencing the introductory module, the trainer should begin with a quick round of introduction of themselves and the participants.

#### Module 1: Recent Developments in Climate Change Science and Policy Paradigm - Global and National

This module will help the participants understand the global climate action, in the wake of proven science, enabled by international cooperation and India's stance in global climate negotiations. The key learning objectives of this module are to build an understanding on the following:

- Climate conditions that allow ecosystems and humans to thrive sustainably
- The Paris Agreement and its objectives
- Global and the national response to Paris Agreement
- Pathway for achieving the objectives of the Paris Agreement
- Pursuing climate actions and Sustainable Development Goals

This module will cover a brief presentation by an expert on international and national climate policy context.

##### ***Session A: Linking climate change with NDC and SDGs***

An expert, invited specially for this occasion may present this session. The trainer needs to have a thorough understanding of the guidance and the session should include:

- Provide a brief context to the Paris Agreement (UNFCCC, 2015) and outline its key objectives
- Highlight the global response that was sought, primarily in the form of Nationally Determined Contributions (NDCs), which are the foundation of the Agreement. Summarize some of the other key mechanisms that form an important part of the Agreement.
- Summarize India's role in the global climate negotiations and the Paris Agreement including the country's NDC commitment which was submitted in 2015.
- Brief description of SDG goals and targets
- SDG alignment and co-benefits of climate change adaptation actions

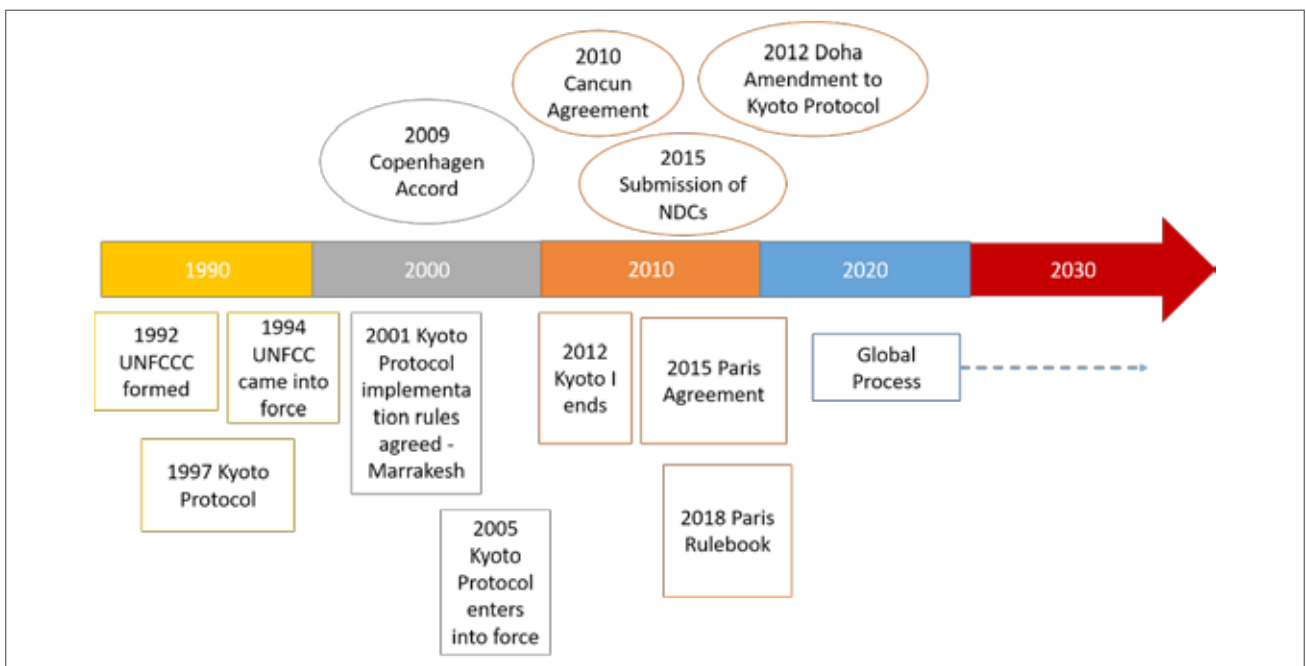


**Figure 6:** Global Sustainable Development Goal (United Nations, 2016)

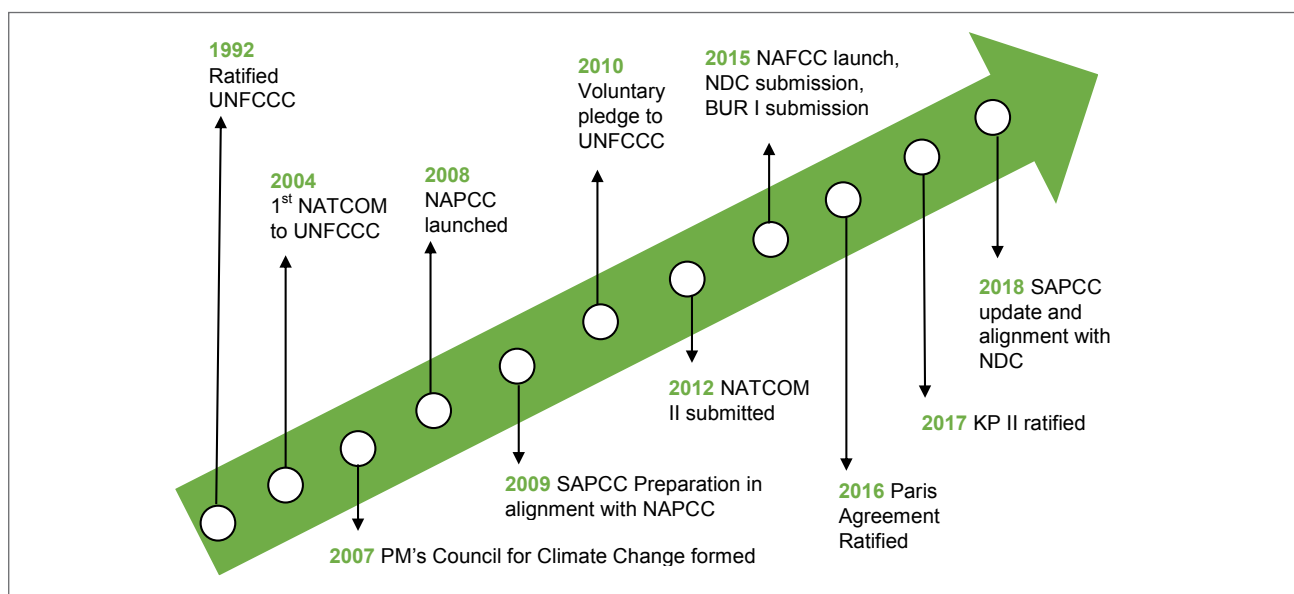
The trainers can explore the United Nation’s Sustainable Development Goals knowledge platform, linked in Annexure 10, to further strengthen their understanding of the SDGs for this segment.

The guidance provided by the trainer for preparation of this presentation should be as follows:

- Provide a brief context to the Paris Agreement (UNFCCC, 2015) and outline its key objectives
- Highlight the global response that was sought, primarily in the form of Nationally Determined Contributions (NDCs), which are the foundation of the Agreement. Summarize some of the other key mechanisms that form an important part of the Agreement.
- Summarize India’s role in the global climate negotiations and the Paris Agreement including the country’s NDC commitment which was submitted in 2015..



**Figure 7:** Overview of international climate negotiations (Adopted from Smith School of Enterprise and the Environment, 2011 and UNFCCC)



**Figure 8:** Progression of National Policy paradigm on Climate Change

## Module 2: Mapping Climate Risks and Adaptation Needs of the State

Key learning objectives of this module are as follows:

- An understanding of climate change and its impacts at the national and state levels, and if possible, to be extended to district level as well.
- Acknowledgement of the importance of building climate resilience given its immense impact on economic growth and development targets of a state.
- A broad understanding of the approach for policy-level changes for climate adaptation.
- Role of NAPCC and SAPCC in streamlining climate adaptation at national and state level.
- Gender mainstreaming in climate change adaptation

**Session A: Climate change scenarios, key impacts in the short, medium and long term, potential liabilities and losses through case studies on sectoral impacts, risk and associated vulnerabilities.**

An expert on climate change modeling should be invited to present on this subject. A proposed presentation structure which can act as the guidance provided to the expert by the trainer is provided below.

- Concepts of climate change (both natural and anthropogenic)
- Two-pronged approach to address climate change (adaptation and mitigation)
- Impacts of climate change at national, state and local levels
- Need for building climate resilience
- Setting the local context through observed climate trends in the state to interest and connect with the participants
- Broader climate observation trends and projections at national and state levels

Information of the national and state level climate impacts can be taken from the sources listed below:

- NAPCC
- Respective State Action Plans on Climate Change
- Climate Change Information accessible at [www.climatevulnerability.in](http://www.climatevulnerability.in)
- IPCC AR5 (IPCC, 2014)

Further, during the session, time should be spent on deliberating over the uncertainty in climate change projections. Subsequently, a few selected case studies should be presented to qualitatively and quantitatively present the impacts of climate change. The case studies should be customised to the jurisdiction where the training is being planned and the specific climate vulnerabilities and risks that the region is facing or is likely to face in the future. This session can be presented by an invited speaker or the trainers can consider a panel discussion amongst sectoral experts on this subject. Selected case studies are presented below.

### **Agriculture**

The projected temperature increase in Himachal Pradesh would cause an overall decline in horticultural/ agricultural production in the state. Further, the line of production of certain crops might shift to higher altitudes due to warming of ambient temperature.

**Case Study:** *Impact of Climate Change on the Apple Economy of Himachal Pradesh: A Case Study of Kotgarh Village*

Kotgarh is a village located in the Kumharsain tehsil of Shimla district in Himachal Pradesh. As per the revenue records, the agricultural land in the village is dominated by apple orchards, owned majorly by small and marginal farmers. The author observes an increasing trend in mean minimum and maximum temperature and a declining trend in winter rainfall (which is important for the apple crop). Correspondingly, stakeholder interaction in the study area revealed that the apple production has declined from 40 to 50 boxes during the peak period to 8 to 9 boxes.

**Source:** Inder Singh (2013). *Impact of Climate Change on the Apple Economy of Himachal Pradesh: A Case Study of Kotgarh Village*. URL: <http://ena.lp.edu.ua/bitstream/ntb/27010/1/008-020-025.pdf>

### **Water**

The projected temperature increase in Himachal Pradesh would cause an overall decline in horticultural/ agricultural production in the state. Further, the line of production of certain crops might shift to higher altitudes due to warming of ambient temperature.

**Case Study:** *Impact of Climate Change on the Apple Economy of Himachal Pradesh: A Case Study of Kotgarh Village*

Kotgarh is a village located in the Kumharsain tehsil of Shimla district in Himachal Pradesh. As per the revenue records, the agricultural land in the village is dominated by apple orchards, owned majorly by small and marginal farmers. The author observes an increasing trend in mean minimum and maximum temperature and a declining trend in winter rainfall (which is important for the apple crop). Correspondingly, stakeholder interaction in the study area revealed that the apple production has declined from 40 to 50 boxes during the peak period to 8 to 9 boxes.

**Source:** Inder Singh (2013). *Impact of Climate Change on the Apple Economy of Himachal Pradesh: A Case Study of Kotgarh Village*. URL: <http://ena.lp.edu.ua/bitstream/ntb/27010/1/008-020-025.pdf>

### **Extreme Events**

Climate change is expected to exacerbate extreme events such as floods and drought by causing shifts in both their frequency and intensity.

#### **Case Study: Extreme weather events in Himachal Pradesh**

Due to climatic extreme events, Himachal Pradesh Economy has faced losses from time to time, both in terms of lives and infrastructural damage such as:

- 2005-06: damage due to drought to the tune of Rs 366 crores due to loss of agri-horti crops, IPH infrastructure and animal husbandry
- 2002-03: damages due to drought to the tune of Rs. 707.21 crores
- 1999: total monetary loss due to widespread rains, flash floods and droughts was estimated at Rs. 23,487 crores

**Source:** Government of Himachal Pradesh (2012). *State Strategy & Action Plan on Climate Change Himachal Pradesh* URL: [https://desthp.nic.in/publications/HPSCCAP\\_A1b.pdf](https://desthp.nic.in/publications/HPSCCAP_A1b.pdf)

### **Forest Cover**

Shifts in forest type is projected due to changing climatic conditions in certain parts of the country.

#### **Case Study: Upward shift of Himalayan pine in Western Himalaya, India**

Analysis of the spread and occurrence of pine species in the Western Himalayas indicate an upward shift of Himalayan pine species, reflecting its sensitivity to climatic warming. This observed rate of upward shift (14 to 19 m/10 years) of pine in the Himalayan region is higher in comparison to other species recorded in Alps and elsewhere, where the maximum upward migration has been recorded to be around 4 m/10 years.

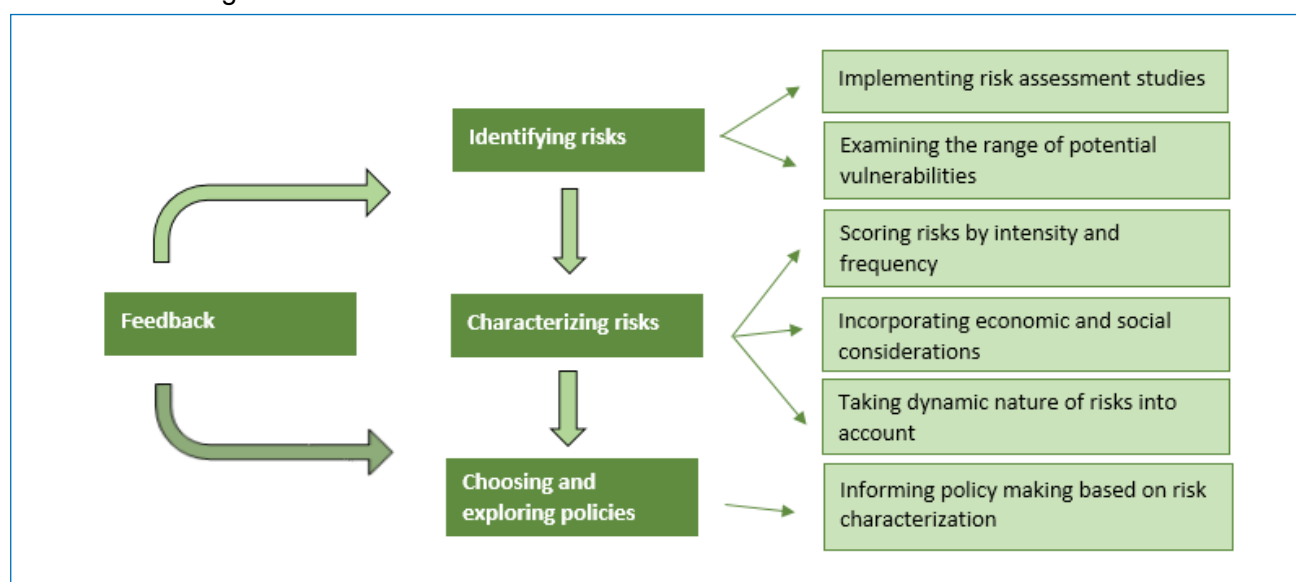
**Source:** B. Dubey et al. (2003). *Upward Shift of Himalayan Pine in Western Himalaya, India*. URL: <http://hpccc.gov.in/PDF/Biodiversity/Floral/Upward%20shift%20of%20Himalayan%20pine%20in%20Western%20Himalaya,%20India.pdf>

### **Session B: Sector-wise climate adaptation measures required in the respective state or district**

At the beginning of this session, the trainer or a high-level official from the nodal climate change cell (host institution for the sensitization programme) should reiterate that there are uncertainties in the future impacts due to climate change. Further, he/she should state that climate risks are a result of complex inter-relation between climatic, economic, social and environmental systems. For instance, the impact of prolonged high temperature (leading to mortality) will be measured through an inter-relation of the exposure and vulnerability of the local population. Thus, certain regions might be more vulnerable due to the underlying socio-economic landscape. However, the policy-making process needs to be such that these uncertainties do not hinder economic and social development in the state. As the characteristics of risks are increasingly difficult to predict over long time-horizons, the policy response should involve a proportionate, flexible and

iterative risk management approach in adaptation planning (Figure 9) (OECD, 2015). This might include:

- Improving knowledge about the risks from climate change through assessments
- Using these assessments to plan for a range of possible outcomes, and not a specific projection
- Accepting that zero risk is unrealistic, and preparing the response and recovery systems to cope with the remaining risk



**Figure 9:** Risk based approach to adaptation (OECD, 2015)

### **Session C: Role of NAPCC and SAPCC**

In this session, the expert will discuss the background of NAPCC and subsequently, the SAPCCs and their significance in planning and risk assessment at the state level. The expert will include following information in the presentation:

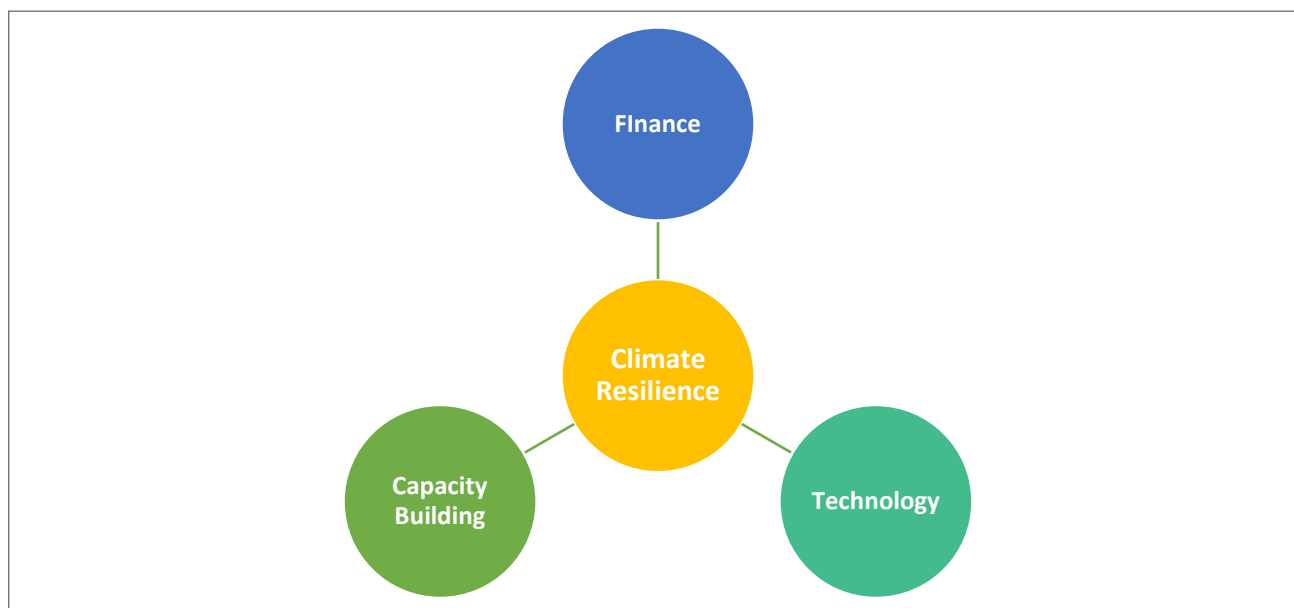
- Rationale of NAPCC and SAPCC
- Brief about the major vulnerabilities and actions identified in the respective state's SAPCC
- Moving forward in climate change adaptation in conjunction with SAPCC goals

## **Module 3: Resource Requirement for Integration of Climate Adaptation in State's Plans**

Key learning objectives of this module are as follows:

- Acknowledge the need for Climate Budget Tagging
- Overarching understanding of various financing sources

At the beginning of the session, the trainer or an invited climate finance expert should present the schematic below to convey the inter-relation between finance, technology and capacity building towards building climate resilience (Figure 10). Further, the trainer should give a quick overview of how the three aspects would be covered over the subsequent sessions.



**Figure 10:** The three aspects of building climate resilience

#### ***Session A: Climate finance requirements and potential financing sources***

The presenter should initiate the session by stating that the combined cost of implementation of the NDCs submitted to UNFCCC is estimated at USD 4.4 trillion (GIZ, 2017). In lieu of the same, it is pertinent for countries to diversify their funding options to undertake initiatives for building climate resilience. Subsequently, the presenter should introduce the concept of Climate Budget Tagging (CBT) to the participants. An overview of the same along with a case study has been provided below.

#### **Climate Budget Tagging (CBT)**

CBT is a budget tool for monitoring and tracking of climate-related expenditures in the budget system. It provides comprehensive data on climate relevant spending, enabling government to make informed decisions and prioritize climate investments. CBT also encourages planning officers and policy managers to incorporate climate considerations in project design from early stages. By generating data on climate change investments which usual budget classification would not do, CBT enables public scrutiny on governments' and donors' spending on tackling climate change issues, strengthening accountability and transparency (UNDP, 2015).

The presenter should reiterate how a CBT exercise would assist the government in tracking the current expenses towards building climate resilience across the economy. It would assist in identifying potential avenues of increasing financing from within the institution and also recognize components that require further funding to build resilience. Subsequently, the overarching landscape of climate finance for adaptation which can potentially be accessed by Indian states should be presented.

#### **Sources of Climate Finance**

There are various sources that can be tapped to support climate adaptation. This can range from exploring opportunities for convergence or realignment of budgets at the local level to accessing dedicated adaptation financing sources available at national and international levels.

The Government of India and international climate finance currently available are listed below.

International Climate Finance
<ol style="list-style-type: none"> <li>1. Green Climate Fund</li> <li>2. Special Climate Change Fund</li> <li>3. Adaptation Fund</li> </ol>
Government of India
<ol style="list-style-type: none"> <li>1. National Missions under NAPCC</li> <li>2. National Adaptation Fund for Climate Change</li> <li>3. Climate Change Action Programme</li> </ol>

Green Climate Fund (GCF) is a key funding source for adaptation at the international level. The GCF was set up by the 194 countries who are parties to the United Nations Framework Convention on Climate Change (UNFCCC) in the year 2010, as part of UNFCCC's financial mechanism. It aims to deliver equal funding to climate change mitigation and adaptation, while being guided by the UNFCCC's principles and provisions. When the Paris Agreement was reached in year 2015, the GCF was given an important role in serving the agreement and supporting its goal of keeping climate change well below 2 degrees Celsius above pre-industrial levels. Details on how these funds can be accessed can be found on its website (Green Climate Fund, 2019)

At the national level, the Government of India established a dedicated fund for climate adaptation called the National Adaptation Fund for Climate Change (NAFCC) in the year 2015. The overall aim of NAFCC is to support concrete adaptation activities which mitigate the adverse effects of climate change. The projects related to adaptation in climate sensitive sectors such as agriculture, animal husbandry, water, forestry, tourism etc. are eligible for funding under NAFCC. National Bank for Agriculture and Rural Development (NABARD) is the National Implementing Entity (NIE). Details on how these funds can be accessed can be found on the NABARD website (NABARD, 2019).

Additionally, at local level, for ensuring that CCA happens on a continuous basis, adaptation needs to be integrated into the ongoing developmental programmes. For example, Government of Himachal Pradesh project supported by GIZ, "Watershed programme in rain-fed agriculture dependent communities in drought prone area to reduce vulnerability and enhance resilience", is helping farmers in Kandroul, one of the villages in Bilaspur, manage their water resources to improve their yields. It is promoting techniques such as check dams and farm ponds to prevent erosion and store water through dry periods. It promotes drought-resistant species such as *Senegalia catechu* (khair), *Callistemon flavovirens* (cheel) or *Phanera variegata* (kachnar). It trains farmers on sustainable water management and improved crop-production techniques such as vermicomposting. The project serves 4,000 farmers, 60% of them women. The project activities have been mainstreamed in HP's Eco-village scheme and MGNREGA scheme.

### 3.5 Training Plan

The training programme for state and district level administrators will be a half day programme with sessions on the modules as discussed above.

- Module 1: Recent Developments in Climate Change Science and Policy Paradigm
- Module 2: Climate Risks and Adaptation Needs of the State
- Module 3: Resource Requirement for Integration of Climate Adaptation in State's Plans

An exhaustive training plan with details on session objectives, duration, methodology to be followed, and the materials required is given in Annexure 4 (A).





## 4. Guidance for Training of State and District Level Administrations

This chapter details the training guidance for State and District Level administrations. Since the guidance on training of these stakeholders is largely overlapping, it is presented as a consolidated chapter. However, the training at these two levels is expected to be conducted separately.

### 4.1 Context

Climate Vulnerability is a function of exposure to climate, impacts, disaster risks, sensitivity, and adaptive capacity (IPCC, 2012). The higher the adaptive capacities of a State, higher are the chances for it to ride over the associated risks and vulnerabilities due to climate change. Adaptive capacity is in turn dependent on the level of development of social, economic, and natural resources of a State. Integration of climate change adaptation from now in developmental programmes of the State is very likely to ensure unhindered sustainable development in the long run.

Further, as district administration oversees developmental activities at sub administrative levels of municipalities, blocks, panchayats, and villages, it is important that climate change adaptation concerns are addressed at this level while it prepares for development action annually.

For this process to be adopted, the state and district level government officials need to be trained to understand the challenges of climate change for the resources they manage and design interventions that would ameliorate the vulnerabilities associated with climate change in that sector. This chapter lays out the guidance on the training modules through which these officials can be trained along with guidance on the resources to be used.

### 4.2 Introduction to the Training Programme

The following subsections outline the objective of the training programmes and the audience or key stakeholders for whom these trainings need to be organized. Subsequently, the next sections will cover:

- **Preparation for the Training:** This section will detail out the research and planning that will have to be undertaken by the trainer to design such a training programme for government departments.
- **Training Modules:** This section describes the various modules and content to be covered under the training programme.
- **Training Plan:** This section provides the recommended training plan which covers information on the modules and sessions to be carried out along with the timing of each session, their objectives, methodology to be used and materials required.

### 4.2.1 Objective

The training will achieve the following key objectives:

- Communicate the need and urgency to integrate climate change adaptation in development planning process.
- Build capacity of the trainees to systematically assess the climate risk, and associated vulnerability due to climate change
- Equip the trainees with frameworks, approaches and reading materials to enable them to undertake climate change adaptation planning, implementation and monitoring within their respective departments.
- Expose the trainees to best practices in climate change adaptation in their sector
- Enable trainees to identify funding sources for climate change adaptation and design adaptation projects for seeking funds and integration in development planning

### 4.2.2 The Audience

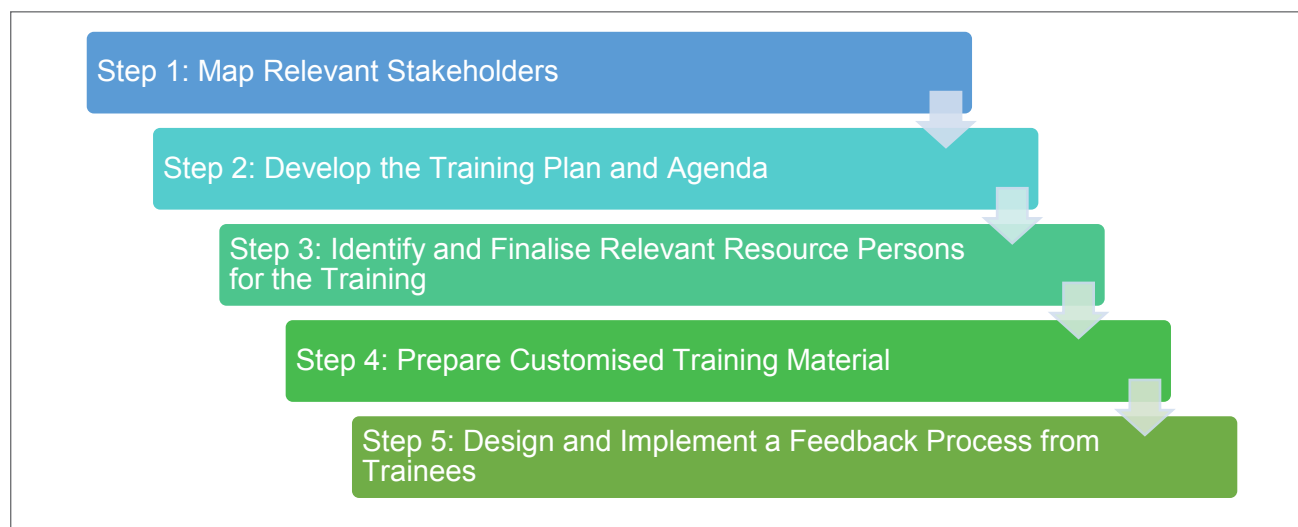
The key audience for the training programme will be the government officials within the State or District level departments that are working in planning, programme or project implementation and monitoring of the following key sectors as identified in SAPCC.

Additionally, officials from cross-cutting departments such as Planning and Finance also need to be invited to attend these trainings for them to understand the need for climate change adaptation and identify mechanisms to factor in climate change adaptation in their respective plans and budgets.

At the district level the District Collector, Deputy Commissioner or District Magistrate, as the case may be invited in order to establish the importance of climate adaptation planning.

## 4.3 Preparation for the Training

To plan for such a training programme, the trainer should undertake the following steps.



**Figure 11:** Training preparation steps

## Step 1: Map Relevant Stakeholders

To map relevant stakeholders, the trainer together with nodal agency on climate change should begin by mapping all the government departments that need to integrate climate change adaptation in their developmental plans and programmes. To carry out this mapping, the trainer can use the long list (provided in Annexure 2) of possible government departments that function in the key areas as discussed in the previous section and further shortlist as per requirements. This should be done by identifying the most relevant departments based on a detailed review of the roles & responsibilities of the long list of departments, as well as their specific plans, policies and programmes that may be relevant for climate change adaptation. The State Action Plans on Climate Change (SAPCCs), listed on the MoEFCC website, can act as the guiding document in short listing the departments and their climate adaptation relevant plans, policies and programmes (MoEFCC Endorsed SAPCCs, 2018). Please refer to Annexure 10 for the Himachal Pradesh SAPCC document.

An indicative framework for mapping the departments, their respective scopes, developmental plans, policies and programmes and the contact details of the officer responsible is provided in Annexure 2. This process will enable the trainers to have an understanding of:

- Existing governance structure
- Functions and mission of each of the Climate Change Adaptation (CCA) relevant department
- An overview of current policies, programmes and schemes that contribute towards CCA under each of the identified departments

## Step 2: Develop the Training Plan and Agenda

Develop the Training Plan and an Agenda for the Programme and impart training based on the following 7 modules (which have been covered in detailed under Section 3.4):

- Module 1: Introductory activities
- Module 2: Setting climate change in the development context
- Module 3: Evaluating climate change vulnerabilities and risks
- Module 4: Field visit to identify on ground climate risks and understand the traditional practices vs. adaptation actions being adopted
- Module 5: Identifying and prioritizing climate adaptation actions
- Module 6: Monitoring and evaluation of adaptation actions
- Module 7: Financing sources for climate adaptation actions

Annexure 3 provides a sample of the agenda. Based on the advisory received on the training to be conducted including the expected audience and duration of the training, the trainer will

- Prepare a list of departments to be invited that are relevant to climate change adaptation
- Customize the agenda of the training containing context of the training, information about the training, agenda and training plan

### Step 3: Identify and Finalize Resource Persons for the Training

It is important to invite resource persons to contextualize climate change and development, especially at the state level. The avenues through which climate change is impacting development and is likely to do so in the future have to be brought out clearly. Hence,, resource persons who are carrying out research on climate trends, projections, impacts, and are planning/ managing relevant areas such as agriculture, forests, biodiversity, water resources and human health in the rural context need to be brought in. Experts who are implementing CCA projects should be invited to share their insights and experiences in the design, implementation and Monitoring & Evaluation of such projects at both the state and district level trainings. Further, experts who are involved in designing projects for accessing finance from various sources for climate change adaptation also should be invited to talk about the available climate finance options along with examples of funded projects. Therefore, experts in the following areas can be invited as resource persons in the training programmes:

- Climate change observations and trends in the global, national, state and district context
- Impacts of climate change on natural resources and human health
- Climate change adaptation planning, implementation and monitoring & evaluation
- Climate finance

### Step 4: Prepare Customized Training Materials

The training will be mainly through one presentation in each session followed by group work and discussions by the participants. The trainer will have to facilitate creation of the groups based on the design of the training programme being conducted and expertise of the participants present. The following items will be needed for conducting the training:

- 1.1. A relevant presentation for each session
2. Exercises to be completed under group work. This will include case studies on the basis of which group work will be undertaken
3. An appropriate venue that can house the desired number of participants in small roundtable seating format (as this allows easy movement in conducting group work and focus group discussions). The trainer has to ensure availability of such a room by constantly liaising with the training institutions who will host the training.
4. Materials required at the training venue to facilitate the training:
  - Pin boards (one for each group) covered with brown paper on both sides
  - Board pins
  - Chart paper cut outs of various shapes and colours
  - Marker pens for all tables
  - Hand held microphone (at least two)
  - Audio-Video system

- Round tables which can have 6-8 participants at each table.
- Set up for conducting panel discussions (if included in the agenda).
- Laptops
- Projector and projection screen(s)

### **Step 5: Design and Implement a Feedback Process from Trainees**

The trainer should design a feedback form to receive inputs from the trainees on the training programme structure and its contents. Incorporating these inputs in future trainings can help the trainer in delivering the programme effectively. Annexure 9 provides sample feedback forms.

## **4.4 Training Modules**

### **Module 1: Introductory Activities**

The training should begin with registration of the participants. The sample of a registration form is provided in Annexure 8. Attendance of the participants must be taken twice a day, every day of the training. Annexure 8 also contains a sample of the attendance sheet. It is proposed that the registration is left open for 30 mins.

First, an inaugural session should be conducted to set the context of the training programme. The inaugural session should begin with a welcome address by the host institution representative. Subsequently, the trainer should present the context and objectives of the training programme. This presentation should list the goals of the trainings programme, its duration and methods that will be used in the process.

Following this, a round of introductions of the trainers and trainees should be carried out. As a trainer, your goal in this exercise is to “break the ice” amongst the trainees and get them acquainted with each other and to start thinking about the subject. Some examples of simple introductory ice-breakers are provided in the training resources below.

Key learning objectives of this module are to achieve an understanding about the training programme, including its goals and methods.

#### **Introductory Ice-Breakers**

- Ask each participant to say their name, designation, organization and an aspect of nature that they relate to most and why.
- Ask each participant to write down the first thing that comes to their mind when they hear the term “climate change”. Then after a couple of minutes, start by asking each participant to say their name, designation, organization and what they have written.

#### **About the Training Programme**

The trainer should make a brief presentation (1-2 slides) which provide an overview to the training programme covering its goals and schedule of sessions.

#### **Training Resource**

Example of the presentation slide is presented below. The slide can be modified depending on the duration of the training programme and to add further details on the objectives of the training if required.

## Goals of the Training Programme

### Day 1:

- Contextualization of climate change, development, and response
- Understanding vulnerability and risk
- Identifying adaptation actions and prioritization
- Reviewing current programmes and identification of opportunities of integrating schemes structured around current concerns

### Day 2:

- On field assessment of vulnerability and adaptation
- Opportunities of climate finance
- Monitoring and evaluation of CC schemes

Hands on training, Field Visits, Sectoral experts giving insights and action oriented suggestions, Training material for reference

**Figure 12:** Presentation slide on 'Goal of the Training Programme'

## Module 2: Setting Climate Change in the Development Context

This module should cover the concepts of climate change (both natural and human-induced) and the two-pronged approach in addressing it, i.e. through climate mitigation and adaptation. The difference between climate variability and climate change should be explained under this module. The need for building climate resilience should be covered by explaining the wide-ranging impacts of climate change on our socio-economic and environmental systems. Providing local context by showing the observed climate trends in the state and district (including temperature rise, precipitation change and extreme weather events) can help capture the interest of the participants. They should be able to connect with the concept of climate change and its impacts, physical and socio-economic, in order to be motivated to act on addressing the issue through effective planning and implementation.

Key learning objectives of this module are as follows:

- An understanding of what is climate change and the actions required to effectively address it
- Acknowledgement of the importance of building climate resilience given its immense impact on economic growth and development targets
- Gender related vulnerabilities and risks of climate change

A presentation summarising the climate actions, planned and implemented, by the State/District where the training is being conducted can be made. The content for this presentation needs to be localised and should focus on development plans, policies and programmes which contribute towards climate change adaptation such as the State Action Plan on Climate Change. It is recommended that trainers visit the websites of the missions and their respective nodal ministries to understand the latest developments being made by them. Information on climate change, its impact, India's policy paradigm on climate change is available in Annexure 5 (parts A, B, C, D, and E).

**Providing local context**

The climate experts brought in should show trends in the form of tables, graphs, maps and recent newspaper clippings to contextualise the issue of climate change for the audience for the state or the district for which the training is being undertaken. Additionally, the trainers should be able to map and discuss key actions being taken to support CCA for the jurisdiction under focus. Examples of slides for the State of Himachal Pradesh are given in Annexure 5.

**Understanding Gender related impacts of Climate Change**

The trainers need to make participants understand the impact of climate change on gender. The discussion can start with the existing inequalities and how they are likely to exacerbate with climate change. This can be achieved through a facilitated discussion with the participants together with an invited expert on gender. The key outcome of the facilitated discussion will be the filling of the matrix in Table 3, which identifies the gender related vulnerabilities that women are exposed to and existing and potential policy measures in the state. Further, they need to address the relevance of gender policies of relevant international climate change adaptation funds as well as national and state level programmes and schemes and their on ground implications. The key objectives of this component is to deliver information on the following aspects:

- Gender and climate change in the state context, accompanied by facts and figures wherever possible
- Integration of gender perspective into project implementation and its long term effects

**Table 3:** State gender vulnerability matrix for facilitated discussion

Aspect	Impact of climate change on gender	Existing policy/ programmes/schemes	Gaps	Recommended actions
Livelihoods	F	MGNREGA		
Health				
Sanitation				
Others as identified...				

***Case Study: Gender inequality in accessing and implementing adaptation interventions***

A study in Himachal Pradesh, indicates that there is a positive relationship between farmers adoption of adaptation strategies and gender of household head with male headed households being 1.915 times more likely to adapt compared to female headed households (coefficient= 0.650; odds ratio= 1.915), where, the relationship was not significant ( $P > 0.05$ ). This indicated that gender of the household head has an influence on farmers decision to adopt adaptation practices. Similar findings have been reported by Okonya et al. (2013). In most of the developing countries, women have lesser access to critical resources like land, cash and labour which undermines their ability to carry out labour-intensive agricultural innovations.

**Source:** Ndungu Charles Kimani and S.K. Bhardwaj, 2015. *Assessment of People's Perceptions and Adaptations to Climate Change and Variability in Mid-Hills of Himachal Pradesh, India*. *Int.J.Curr. Microbiol.App.Sci* (2015) 4(8): 47-60. Available at: <http://www.indiaenvironmentportal.org.in/files/file/people%20perceptions%20climate%20change.pdf>

## Module 3: Evaluating Climate Change Vulnerabilities and Risks

This module should begin by highlighting the observed climate trends and projected climate scenarios in order to highlight how the climate has been changing and will continue to change in future as well. A general overview of climate change occurring at the global scale followed by downscaled trends observed in India, the State/District, where the training is being conducted, can be shown. Subsequently the latest research on the climate change scenarios should be shown.

Under this module, the trainers should highlight the key impacts of climate change on our biophysical and socio-economic systems. The latest IPCC publications (IPCC, 2014) can be referred to for identifying the climate change impacts. A key driver for action towards climate adaptation at the State level will be establishing how climate change affects India and the State/District where the training is being conducted. To this end, the trainers should plan for presentations or a panel discussion on the sectoral impacts of climate change by renowned experts and researchers working in the State/District.

Finally, the module should cover the concepts of climate risk and vulnerability assessment. The approaches available for conducting these assessments should be discussed. Case studies of other sub-national governments that have conducted these assessments should be presented. The trainers should provide hands-on training to the participants through a group activity on “Climate risk assessment at a sectoral level”. Through this group activity the participants will develop information that will feed into the group activities in later modules.

Key learning objectives of this module are as follows:

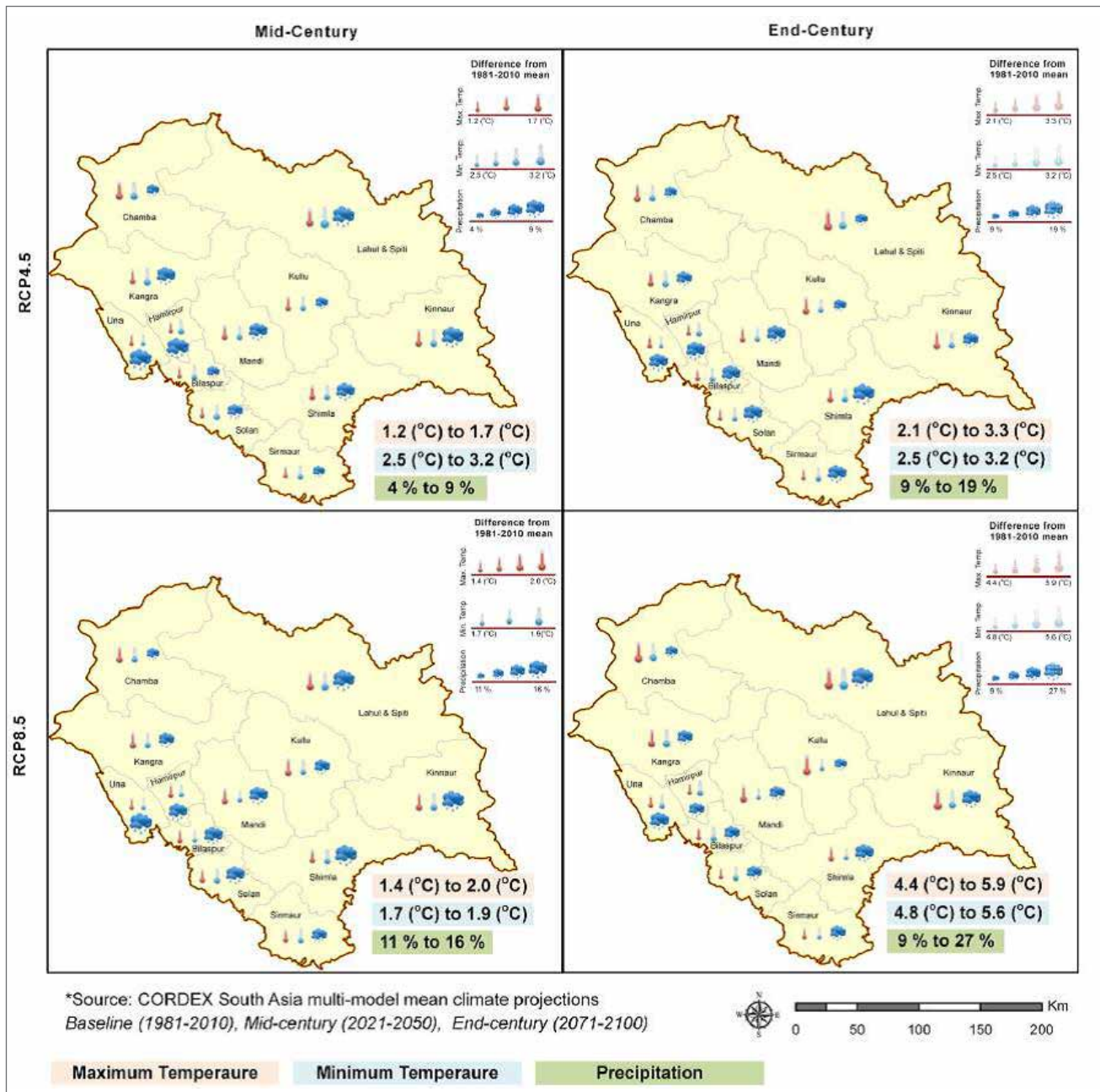
- Acknowledgement of the risks and sectoral impacts of climate change
- A clear understanding of the process and approaches for conducting climate risk and vulnerability assessment.

### Training Resources

#### **Observed Climate Trends and Climate Change Scenarios**

This section of the presentation should cover the following:

- Average, minimum and maximum temperature trends and projections (spatial spread- annual, seasonal, extreme temperature and their likely durations)
- Precipitation (spatial spread – annual, seasonal, extreme precipitation, likely duration, return periods of extreme precipitation events)
- Sea Level rise (trends and projections and area along the coast likely to be inundated)
- Sea Surface temperature by depth along the coast (current spatial trends and projections)
- Any other parameter that is relevant to developmental planning



**Figure 13:** Summary of Change in Projected Climate for Districts of Tamil Nadu

### **Impacts of Climate Change**

Key resources for understanding the impacts of climate change include:

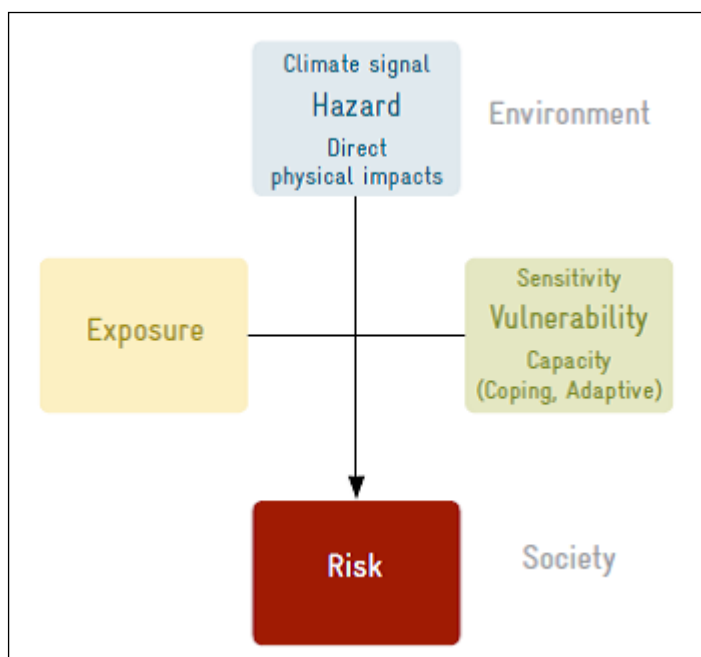
- IPCC reports for global and regional level impacts (A slide providing the key observations of climate impacts that are relevant for India from the IPCC AR5 and the IPCC Special Report on Global Warming of 1.5 °C is provided in part A of Annexure 5)
- MoEFCC's report titled "Climate Change and India: A 4x4 Assessment – A Sectoral and Regional Analysis for 2030s" (MoEFCC, 2010), NATCOM and BUR for national level impacts
- SAPCCs and independent studies (refer to Annexure 10)

Trainers are recommended to keep track of and refer to the latest versions of IPCC reports, MoEFCC review reports for India and SAPCCs, as and when they are updated, for capturing the latest knowledge on climate impacts. Additionally, they may refer to new publications in journals on the same topic

Group Activity: Climate risk assessment at a sectoral level

**Trainers are recommended to**

- Divide the participants into CCA relevant sectors based on the subject matter that they are dealing with, i.e. Agriculture, Water resources, Forests & Biodiversity, Rural Livelihoods, Health, Coastal Zones and Rural Infrastructure. Each group should ideally constitute of 4-8 people.
- Next make an action learning presentation using slides available in Annexure 5 linking exposure, sensitivity, impacts, risks, adaptive capacity, and vulnerability as indicated in Figure 14. Repeat with another example also listed in Annexure 5. This process will ingrain the concept of evaluating climate change risks and vulnerabilities.
- Next for group work, present Table 4 (See below), with examples, to guide the sectoral groups towards identifying the risk associated with different systems in each of their respective sectors that are exposed to changing climate including changing nature of hazards. The risks will be the probability of an adverse situation occurring due to the climate signal affecting the exposed system and will be a function of its sensitivity, adaptive capacity and hence its vulnerability to climate change. The methodology of identification of risks is in line with the IPCC AR5 concept that has brought in the element of risk due to climate change (see Figure 14) for consideration by climate change adaptation planners.
- Keeping in view the adaptive capacities present, rank and hence prioritise the risks as high, medium or low.



**Figure 14:** IPCC AR5 concept on climate risk (IPCC, 2014)

**Table 4:** Illustrative example of agriculture sector climate risk assessment

Current Climate signal	Future Climate Projection	Exposure	Impact	Sensitivity	Adaptive Capacity	Vulnerability	Risk	Risk rating
Rise in temperature w.r.t 30 year climate of the State	Further rise in temperature by mid century	Rice Production system in lower altitudes	Reduced production	Temperature beyond 30°C during growing period leading to early flowering	Some farmers having larger land are sowing thermal resistant variety of crops in certain portions of their land	Marginal farmers are vulnerable as they have very small land and to meet their food security plant only rice in their land	Food security of marginal farmers  Associated livelihoods at risk	H  VH
<b>Increase in extreme rainfall (Hazard)</b>	Recurrence of heavy precipitation events projected to increase to once in every 10 years instead of every 100 years	Upland rice	Heavy soil erosion	Soil nutrient eroded	Some farmers have shift to terrace farming  PDS available	Crop production of yet farming on mountain slopes in landslide prone areas affected	Associated food security and livelihoods at risk	VH
<b>Increasing intensity of hailstorms</b>	Further increase in intensity of hailstorms projected	Apple and other fruit production	Immature fruits grounded due to hail storms	All fruit trees that flower or bear trees in pre and post monsoon period when hailstorms occur	Anti-hail guns and anti-hail nets  Intercropping with vegetables that mature every 3 months	Farmers totally dependent on one fruit	Livelihood at risk	VH
<b>Increasing frequency of droughts (Hazard)</b>	Increasing intensity of droughts projected	Cattle	Reduced milk production	Lower green fodder availability	Milk powder available through PDS	Children	Child nutrition	M
Cloud burst (hazard)	Increase in intensity projected	Fisheries	Washing away of fish	Cold climate fish	none	Marginal Fishermen families	Economic security of fishermen	H

## Module 4: Field Visit

This module should be designed as a half day or full day exercise where the participants are taken to visit a climate vulnerable community and/or an institution working towards building climate resilience of a community or sector. This will provide a glimpse to the trainees on the real-world challenges and implications of climate change on communities and demonstrate actions being taken to build climate resilience. As an alternative, a field visit can also be designed to demonstrate the importance of building climate resilience through various approaches for example, visit to technology centres such as CRIDA extension centre may showcase new technologies that can bring in climate resilience in agriculture sector.

See Annexure 7 for some indicative issues that need to be queried in the field visit.

Key learning objectives of this module is to provide practical experience of the participants on the local impacts of climate change, the resulting vulnerabilities & risks, and the adaptation measures being taken to build resilience.

## Module 5: Identifying and Prioritizing Climate Adaptation Actions

Adaptation planning requires “system dynamics” approach for thinking about rural areas given their complex interactions between people, institutions, physical infrastructure and sectors. This module should cover how the concept of resilience can be used to develop a suite of adaptation strategies that can address the climate vulnerabilities. The trainers should explain the concept of understanding the “adaptation gap” and application of the “climate lens” approach (refer to part G of Annexure 5).

Further the process for identification and prioritisation of adaptation actions should be explained. The trainers should provide guidance on how to develop evaluative criteria for prioritizing climate adaptation actions. There are various methods that can be used for applying the evaluative criteria developed. The chosen method should give due emphasis to multi-stakeholder participation, accountability and transparency. Examples of the methods could include multi-criteria decision analysis and cost benefit analysis among others.

Key learning objectives of this module will be to enable the participants to develop adaptation strategy and plan adaptation interventions. Training resources on adaptation planning are provided in part F of Annexure 5.

Key learning objectives of this module will be to enable the participants to develop adaptation strategy and plan adaptation interventions. Training resources on adaptation planning are provided in part F of Annexure 5.

### **Group Activity: Climate Adaptation Planning**

The following exercises have to be carried out by each of the sectoral groups constituted under the previous module:

- a) a) For each risk identified, map existing PPS which can help address risk. Apply the climate lens approach to identify the amendments required in the PPS.
- b) Identify a range of adaptation actions that can help address the climate risks that are not covered under the existing PPS. Develop a list of evaluation criteria for prioritizing the adaptation action options identified.

- c) Develop a set of indicators for monitoring the climate risks, assessing the performance of the adaptation actions overtime and evaluating the outputs, outcomes and impact achieved.

## Module 6: Monitoring and Evaluation of Adaptation Actions

This module should establish the need for developing an effective Monitoring & Evaluation (M&E) for the “Adaptation Actions”. Well-designed M&E systems not only allow effective impact assessment of the adaptation actions, but as well setup feedback loops which can lead to mid-course correction and improve future planning efforts. The trainers should provide guidance on how to develop M&E frameworks specifically for climate risks and adaptation actions.

This module will take forward the group activity from the previous module with the participants in order to build their understanding on identification of adaptation gaps, selection of adaptation actions and development of M&E system for the actions identified.

Key learning objectives of this module is to achieve an understanding of Monitoring and Evaluation frameworks for climate adaptation amongst the participants. The M&E modules will make the trainees familiar with the following:

- The state context and purpose of M&E system
- The rationale, potential, and challenges of M&E for adaptation
- Process to develop an effective M&E system as part of adaptation planning
- Specific approaches for M&E at state and project level
- Developing adaptation specific indicators

Training resources is available in Annexure 5 (part H).

## Module 7: Financing of Climate Adaptation and Preparation of Project Proposals

This module should provide range of options available (including those within the purview of the government and external public and private financing sources) for financing adaptation programmes and projects. The trainers should help the participants understand that climate adaptation should be financed through multiple sources, covering both public and private sources, and using different financing instruments such as grants and debt mechanisms.

This module should help the trainees understand the steps to be followed in developing coherent, bankable proposals for seeking climate finance from national and international sources. It should cover the steps to be followed starting from defining the problem and project objectives to developing the implementation plan and M&E framework for impact assessment. Examples of the project design and approval process for key climate funds such as India’s National Adaptation Fund on Climate Change, the UNFCCC’s Adaptation Fund and Green Climate Fund should be covered.

Key learning objectives of this module are as follows:

- An understanding of the range of climate finance options available to fund climate adaptation strategies, including international, national and local sources.

- An understanding of the process to be followed in developing coherent, bankable project proposals for key climate funds at the international and national level

Training resource is available in Annexure 5 (part I).

**Case Study: Sustainable Livelihoods of Agriculture-Dependent Rural Communities in Drought Prone District of Himachal Pradesh through Climate Smart Solutions**

The project is targeted towards the poor, small, small and marginal farmers in drought affected areas of Sirmour district in Himachal Pradesh. Climate Smart Farming Technologies are being introduced to reduce the climate vulnerability and adaptive capacity of the rural marginal farmers. Social engineering practices and capacity building exercises have led to an improvement in food security and livelihood diversification in the region. Risk transfer instruments such as weather insurance are being leveraged to alleviate the vulnerability in the region. Other climate proofing measures include poly lining of hilly areas, setting up drip and sprinkler irrigation, lift irrigation, and diversification of the cropping system to adapt to moisture stress conditions. The project aligns with the National Mission on Sustainable Agriculture and SDGs 2 and 13. Further, it is aligned with other central and state schemes to avoid duplication.

## Preparation of Project Proposals

Trainers should refer to the dedicated websites and guidelines of the following key climate funds available in order to develop content on the project proposal development process:

- a) National Adaptation Fund on Climate Change: Implementation Guidelines - <https://www.nabard.org/auth/writereaddata/File/FinalImplementationNAdaptFund.pdf>
- b) Green Climate Fund: <https://www.greenclimate.fund/how-we-work/funding-projects/fine-print>
- c) Adaptation Fund: <https://www.adaptation-fund.org/apply-funding/project-funding/>

## 4.5 Training Plan

The training programme for state and district level administrators will be spread over 3 days with one full day of field visit to understand the implications of climate change on communities with sessions on the modules as discussed above.

- Module 1: Introductory Activities
- Module 2: Setting the Climate Change and Development Context
- Module 3: Evaluating Climate Change Impacts, Risks and Vulnerabilities at the State and District Levels
- Module 4: Field visit
- Module 5: Climate Adaptation Planning
- Module 6: Monitoring and Evaluation
- Module 7: Financing of Climate Adaptation

An exhaustive training plan with details on session objectives, duration, methodology to be followed, and the materials required is given in Annexure 4 (B).



## 5. Guidance for Training of Panchayati Raj Institutions at village and block levels

### 5.1 Context

*“True democracy cannot be worked by twenty men sitting at the centre. It has to be worked from below by the people of every village.” –*

Mahatma Gandhi

The 73rd amendment of the Constitution of India provided the constitutional status and institutional framework to Panchayats to strengthen grassroots level democracy through elected self-governing local bodies in the rural areas of the country. The Constitutional amendment also emphasised functional and fiscal decentralisation of powers to achieve good governance through people’s participation and thus enabling transparency, responsiveness, equity, efficiency and accountability.

Article 243G of the Indian Constitution mandates preparation of plans for economic development and social justice by Gram Panchayats (GPs). Gram Panchayats are small bodies usually elected for a period of five years. This provision is intended to empower the GPs by enabling the State Governments to devolve powers and authority including those matters listed in the 11th schedule for planning and implementation of schemes for economic development and social justice. This also covers the powers to impose taxes and provisions of funds to the Panchayats. The 11th schedule for planning includes 29 subject areas for which funds can be sought for village development, and they are

- Agriculture, Animal Husbandry and dairying, and fisheries including agricultural extension
- Minor irrigation, water management and watershed development plans
- Maintenance of community assets
- Land improvement, implementation of land reforms, land consolidation and soil conservation
- Social forestry and farm forestry including minor forest produce
- Small scale industries including food processing, Khadi village and cottage industries
- Rural housing
- Fuel and fodder
- Drinking water
- Roads, culverts, bridges, ferries, waterways and other means of communication
- Rural electrification including non-conventional sources of energy

- Poverty alleviation Programmes
- Education including adult education, technical training, and libraries
- Improvement in market access
- Health, sanitation and family welfare including women and child development
- Inclusive social welfare
- Public distribution system

Gram Panchayat Development Plans (GPDPs) should ideally match people's needs, basic services and their aspirations, prioritized in accordance with the available resources. It should be prepared through a participatory, inclusive and transparent process. The funding envelope for the Gram Panchayat planned activities include:

- 14th Finance Commission funds for preparation of gram panchayat plans,
- State Finance Commission grant,
- Own Source Revenue (OSR),
- MGNREGS as per approved Labour Budget,
- Other centrally sponsored schemes and state schemes entrusted to GPs,
- Schemes for which GP's take the decision even if the fund is not transferred,
- CSR funds if assured and available to GPs,
- Voluntary contributions (Cash, kind and labour), and
- Funds available through banking sector / leveraging bank finances

Clearly the GPDPs provide an entry point for climate resilient planning at the village level as:

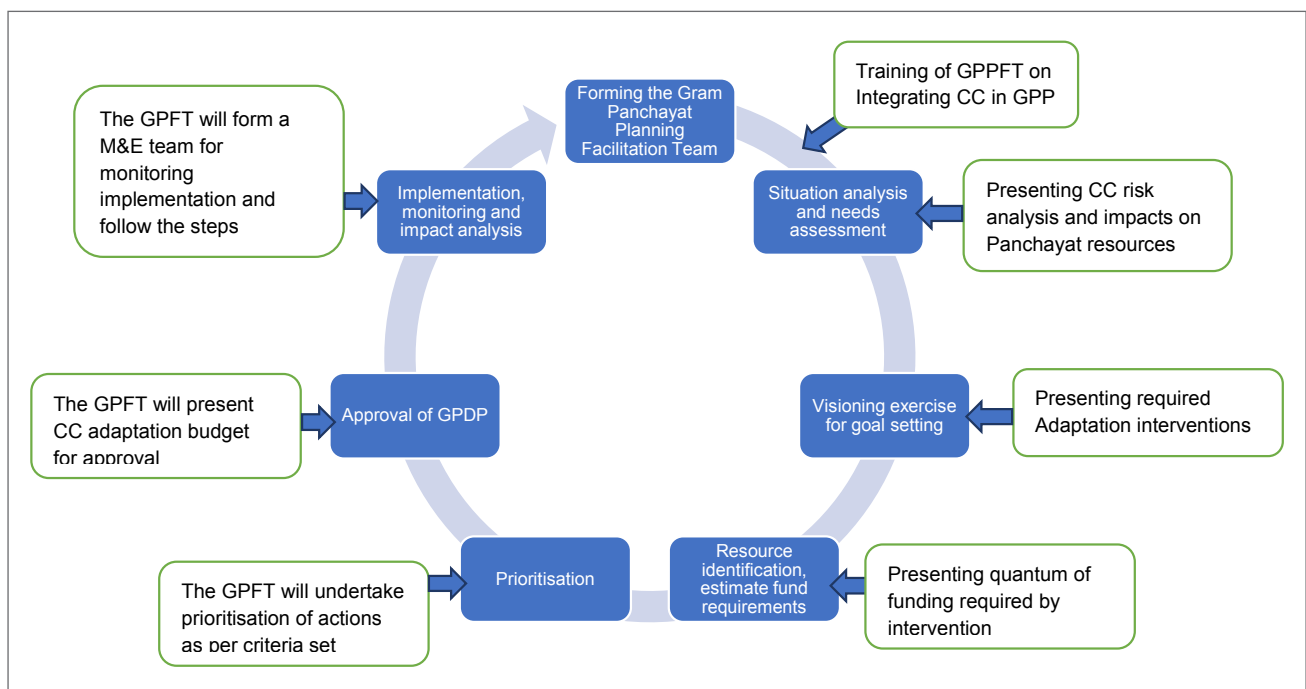
- Gram Panchayats are mandated to prepare development plans while ensuring sustainability of their natural resources on which their livelihoods and local economy depends. As climate change leads to localized impacts and vulnerabilities, therefore integrating adaptation actions in GPDPs will ensure sustainability of resources and livelihoods in the long term.
- These plans take into account concerns of all sections of society and a holistic approach to developmental needs of the villages
- These plans enable devolution of government programme funds in a converged manner at that level

The GPDPs are five years plans, implementable on annual basis, based on the priorities that are identified by the Gram Sabha which consists of all adult members of a village. After implementation of annual plan, the perspective plan is reviewed taking the performance/feedback/impact of the annual plan implementation into account and make changes and reprioritise the activities/projects for the coming financial year. At the end of fifth year, a fresh five-year perspective plan is prepared. All these processes need to be taken up and completed within a stipulated time. Panchayat and its committee play very important role from initiating to completing of planning and then implementing and monitoring (see Figure 14 below indicating

the GPDP preparation cycle (Ministry of Panchayati Raj, 2018).

Considering that the Gram Panchayat Plan follows a cycle, it is suggested that the training of the Gram Panchayat Planning Facilitation Team for integrating climate change in their planning should be done at the beginning of the cycle. Figure 14 below indicates the steps that need to be conducted in sync with the GPDP process for climate change adaptation to be integrated within the planning process.

The following sections, indicate the steps through which the GPPFT will identify the climate risks, extent of climate impacts and vulnerabilities, identify adaptation actions and prioritise, budget the same, identify the financing source, and develop M&E framework for overseeing effective implementation of the climate change adaptation interventions.



**Figure 15:** Gram Panchayat Development Plan (GPDP) preparation cycle and entry point for enabling climate change resilient development planning and implementation

## 5.2 Introduction to the Training Programme

The following subsections outline the objective of the training programmes and the audience or key stakeholder(s) for whom these trainings will need to be organized. It also covers the focus areas for these trainings and the methods to be used during the programme. Subsequently the next sections will cover:

- **Preparation for the Training:** This section will detail out the research and planning that will have to be undertaken by the trainer to design such a training programme for gram panchayats.
- **Training Modules:** This section describes the various modules and their content to be covered under the training programme.
- **Training Plan:** This section provides the recommended training plan which covers information on the modules and sessions to be carried out along with the timing of each session, their objectives, methodology to be used and materials required.

### 5.2.1 Objective

The overall objective of this training is to build capacity of gram panchayats to develop climate resilient Gram Panchayat Plans. The immediate training objectives being:

- Enable an understanding of risks and vulnerabilities of natural resources and human well-being of gram panchayats due to climate change
- To enable understanding of the fact that climate risks of the villages need to be systematically addressed
- Build capacity of the Gram Panchayat members to systematically assess the climate risks and associated vulnerability of the Gram Panchayat due to climate change
- Equip the Gram Panchayat with frameworks, approaches and reading materials to enable them to integrate adaptation in gram panchayat planning to address risks of climate
- Enable them to convert the assessment into projects that they need to implement to make the associated villages climate resilient.

### 5.2.2 The Audience

The audience of the training will be the Gram Panchayat Planning Facilitation Team (GPPFT) for developing the Gram Panchayat Development Plan. The members of the GPPFT are:

- Sarpanch - Chairperson
- GP secretary - Member Convenor.
- Elected Ward members of GP
- Former Elected Representatives of GP.
- Other employees of the GP.
- Employees of the line departments operating at the GP level such as
  - Krishi Prajukti Sahayak,
  - Anaganwadi Workers (AWW)
  - Accredited Social Health Activist (ASHA)
  - Health Workers,
  - Health Supervisors,
  - AW Supervisors,
  - MGNREGA Workers
- Serving and Retired government functionaries of the GP.
- Education Experts / Teachers
- Frontline workers of Swach Bharat and ASHA Health Workers

- Community leaders
- Representatives of Community Based Organisations
- Gram Rozgar Sahayak
- Elderly citizens of the GP.
- SHG/GP Level Federation office bearers.
- Volunteers from youth/ students/ NSS/NCC
- NGOs working in local areas
- CSR representatives operating in the Gram Panchayat
- Citizens of the Panchayats working/living in the country or outside (Special invitees)
- Representatives of Farmer Producer Companies
- Any other may be added as per the suggestion of the Sarpanch

The mixed representation in the GPPFT should ensure adequate women participation in planning for integrating climate change adaptation in gram panchayat development. Also the GPPFT is mandated to support gram panchayat planning that address the issues of multi-dimensional poverty, exclusion and vulnerabilities faced by women from marginalised social groups such as SCs, STs, single-women headed households, women with disabilities, Nomadic - denotified and primitive tribes and others.

### 5.2.3 Focus Areas

The villages in India are majorly dependent on natural resource services for their livelihoods. Therefore, sustainability of the natural resources even in a changing climate context is essential to ensure livelihood security of the rural population and its general wellbeing.

Key focus areas of management in the rural context for building climate resilience would include the following but not limited to:

- Agriculture, including agricultural extension
- Land improvement, implementation of land reforms, land consolidation and soil conservation
- Minor irrigation, water management and watershed development
- Animal husbandry, dairying, poultry, fisheries
- Social forestry and farm forestry
- Minor forest produce
- Small scale industries, including food processing industries
- Khadi, village and cottage industries
- Rural housing
- Rural Drinking Water

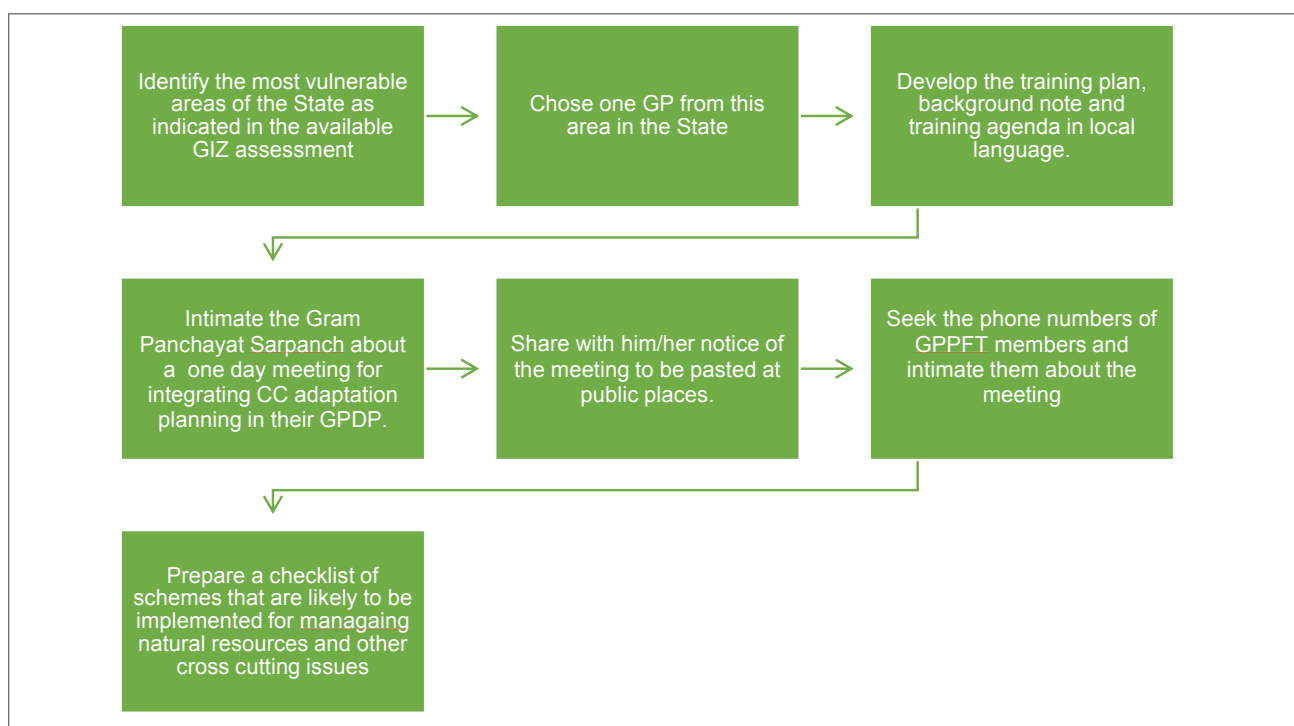
- Fuel and fodder
- Road, culverts, bridges, ferries, waterways and other means of communication
- Maintenance of community assets
- Rural electrification, including distribution of electricity
- Non-conventional sources of energy
- Poverty alleviation programme
- Markets and fairs
- Health and sanitation including hospitals, primary health centres and dispensaries
- Women and Child Development
- Social welfare, including welfare of the handicapped and mentally retarded
- Welfare of the weaker sections, and in particular of schedule caste and schedule tribes
- Public distribution system

#### 5.2.4 Method of Training

The method of training is through participatory appraisal method using focussed group discussion. It is necessary to carry out the training entirely in the local language.

### 5.3 Preparation for the Training

The following steps need to be followed for preparing for the training



**Figure 16:** Training preparation steps

### Step 1: Identifying the villages

The trainer should refer to the ATLAS on Vulnerability of Indian Agriculture to Climate Change (Central Research Institute for Dryland Agriculture, 2013) as well the GIZ Climate Impacts and Vulnerability Assessment of the Water Sector studies to identify the most vulnerable districts. Within these districts, further gram panchayats can be identified that are facing rural distress due to recurrent droughts or floods.

### Step 2: Identifying the Participants

The trainer will need to get in touch with the BDO of the block within which the targeted gram panchayat is existing and take the list of the GPPFT and their contact information. The trainer should ensure that women's SHGs are represented in substantial numbers to ensure an inclusive climate resilient planning. Please refer to section 4.2, "The Audience" that presents the potential participants.

### Step 3: Ascertaining the Timing

The trainer has to identify the timelines of preparation of the Gram Panchayat Plan as available with the BDO. Based on this, the GPPFT chairperson should be contacted and the training should be planned such that it coincides with the initial planning process at Gram Sabha Meetings for developing the Gram Panchayat Development Plan. The table below indicates the timeline of Gram Panchayat Planning Process.

**Table 5:** Gram Panchayat Planning Time Lines (Ministry of Panchayati Raj, 2018)

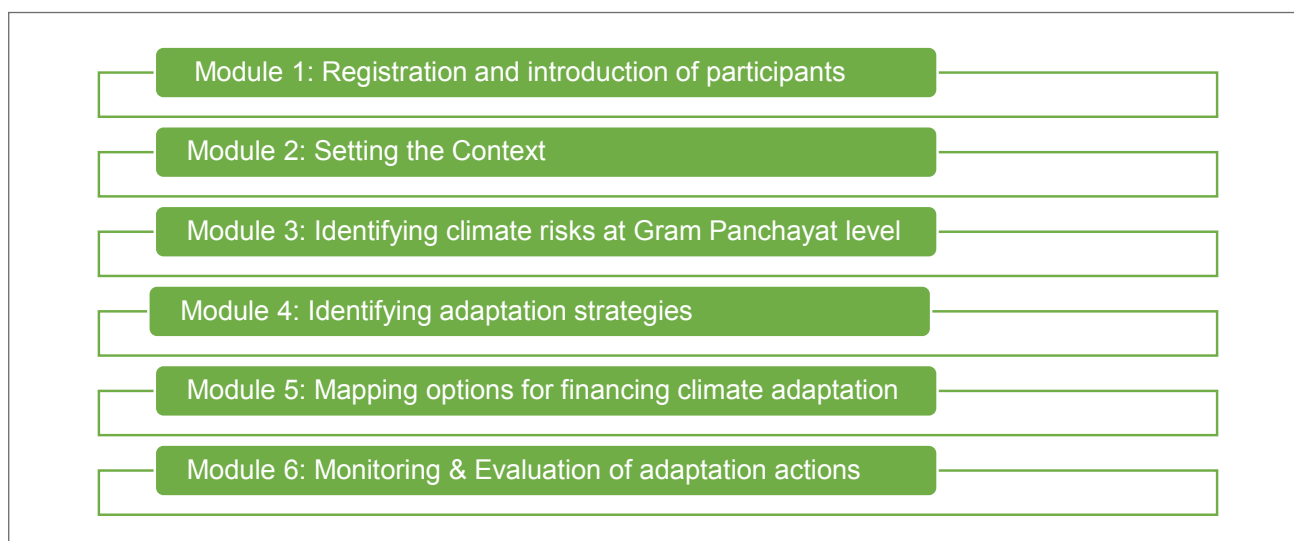
Sl. No	Activities/Steps	Time Schedule
1	Initiation of Planning Process at Gram Sabha Meetings	In month of May
2	Sector wise data collection, compilation and situational analysis	By mid-July
3	Sector wise prioritization and fund allocation to the Sectoral Standing Committee	By end of July
4	Sector wise draft Plan and Budget preparation and Placement of Draft Plan and budget of Gram Panchayat in the meeting of Standing Committees	Mid-September to Mid-October
5	Placement of Draft Plan and Budget of Gram Panchayat in a Special Gram Panchayat	By end October
6	Placement of Draft Plan and Budget of Gram Panchayat in the Ward Sabha Meeting (where it is applicable)	November
7	Placement of Draft Plan & Budget of Gram Panchayat in the Gram Sabha Meeting for Approval	By 31st December

### Step 4: Drafting Agenda

A one-day agenda needs to be formed and communicated to the GPPFT in time. It needs to be ensured that the agenda is displayed on the Gram Panchayat Office Notice Board and at public places in the Gram Panchayat. Separate invites should go to all the GPPFT members and confirmed telephonically. Tea and Lunch has to be provided for all the participants to remain engaged through the day. A sample agenda of the meeting is presented in Annexure 3.

## 5.4 Training Modules

The following training modules will be delivered through a one-day training to Gram Panchayat on integrating climate change adaptation into their developmental plans:



**Figure 17:** Training Modules for community level training

## Module 1: Introductory Activities

The basic objective of this module is to impart to the audience the objectives of training programme

### Learning Elements

Following are the elements of this module:

- Registration of participants using registration sheet
- Introduction of the Participants
- Goals and Objective of the Training

### Training resources

For the registration format see Annexure 8.

Participants will introduce themselves. They will need to mention their names and affiliations, SHG, NGOs, departments etc. For Goals and Objectives refer to section 4.2.

## Module 2: Setting the Context

### Key Learning Objective

The key learning objective of this module is to establish that climate change is happening and that it needs to be addressed at village panchayat level planning

### Module Content

- Objective
- Observed Climate change trends at national, state and district level
- Future projections of climate change
- Impact of climate change on natural resources and dependent livelihoods

- Why is it important to integrate Climate Change in Gram Panchayat Plans
- A group work to assess the climate change perceived at village level

### Training Resource

Use the presentation prepared for **the section on Guidance on Integrating Climate Change Adaptation in Development at Gram Panchayat Level** offered with the training guidebook. Ensure that only the climate change projection slides for relevant state where the exercise is being undertaken are included and the other state slides deleted (the slide deck contains climate projections for all states).

Note: Conduct FGD (Group work) with the GPPFT to understand the perspectives of villagers on changing climate and extreme events at the village level. Include people who are at least 50 and above. Women must be part of the group. Count number of people in the FGD. Record the number of people saying Yes/No/Don't know to assess percentage of in each category. Use a matrix as illustrated the table below.

**Table 6:** Perception on climate change amongst FGD participants

Climate Parameter	Yes (%)	No (%)	Don't know (%)
Temperature Rising			
Extreme heat days increasing			
Rainfall is unpredictable			
Onset of monsoon late			
Early withdrawal of monsoon			
Long dry spell			
Drought frequency increasing			
Hail storms beyond autumn & spring			
Extreme cold days increasing			
Wind storms getting stronger			
Soil erosion is increasing			
Sea level rise is happening			
Salt water ingress is more inland			
Cyclone frequency more			
More severe cyclones			
Storm surges are stronger			

## Module 3: Identifying Climate Risks at Gram Panchayat Level

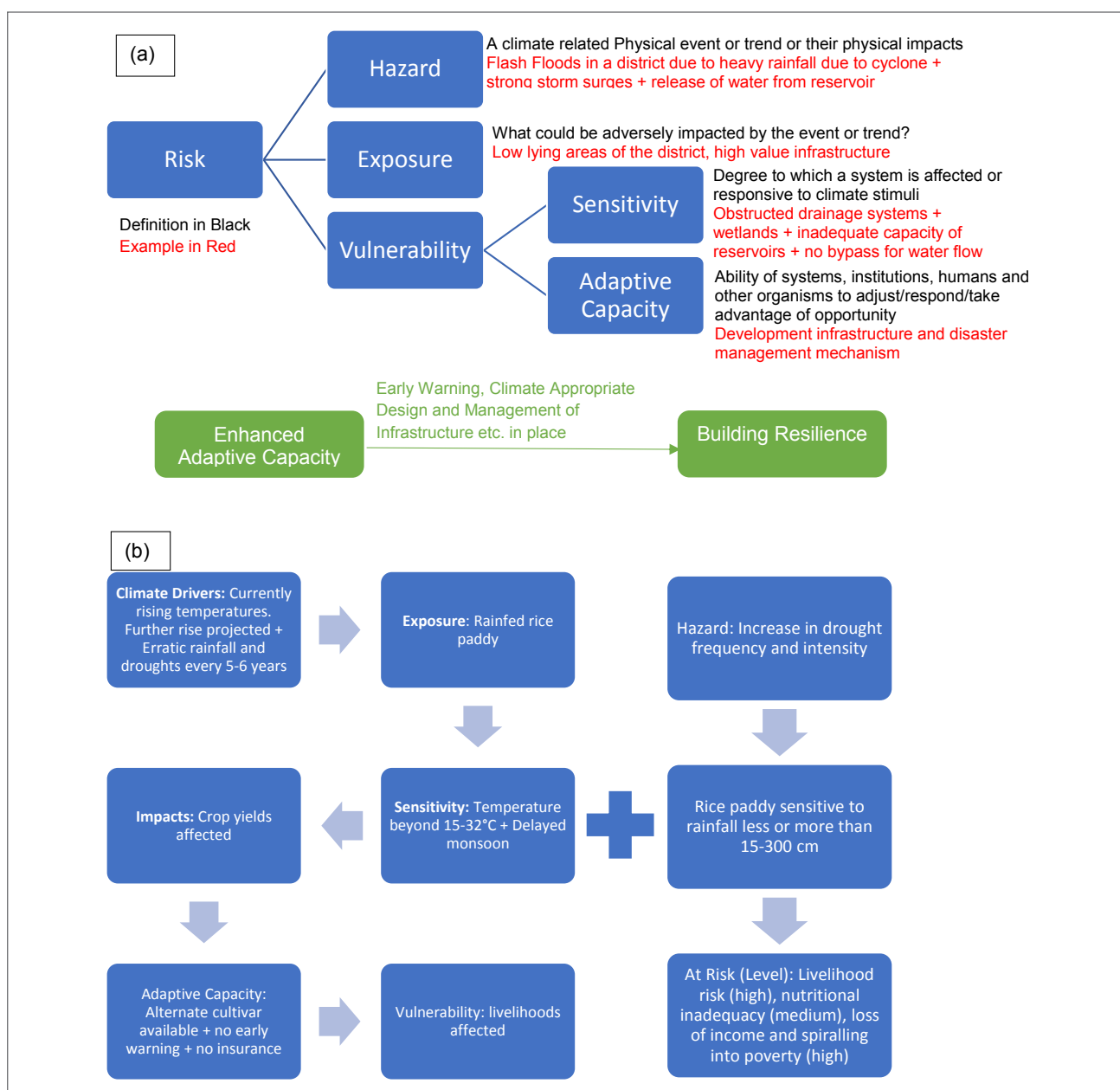
### Learning Elements

- Identification and prioritization of key climate risks and vulnerabilities of the village(s) under consideration.
- Mapping of the resources available in the village(s)

The trainer will carry out the following activities:

- Make an action learning presentation on linking exposure, sensitivity, impacts, risks, adaptive capacity and vulnerability. Repeat with another example (slide 30). This process will ingrain the concept of evaluating climate change risks and vulnerabilities.

- Next with Gram Panchayat Planning Facilitation Team (GPPFT) will map village lay out and its resources on a chart paper indicating key adaptive capacities in place including settlement lay out, farm land, forest, school, gram panchayat office, health care unit etc. Further list out other facilities available such as schools, internet, electricity, piped water to homes, KVK support if any, market access etc.
- Next undertake Focused Group Discussions (FGD) with the GPPFT members to identify and prioritise the climate risks and vulnerabilities of the village using Table 7. This table only focuses on irrigation system in the village as an example, but the trainer will consider all natural resources and associated assets that are at risk due to climate change. This is similar to Table 4 that follows the concept of risk assessment as per IPCC AR5 report (IPCC, 2014) and also presented in Figure 14. The concept suggests that planners at all levels of governance including at GPFT level need to take into account the risk of occurrence of adverse climate hazards that are riding the continued rise in temperature.



**Figure 18:** (a) and (b) Examples of action learning for identifying climate vulnerability and Risk

**Table 7:** FGD matrix to be used for identifying vulnerability and risk due to climate – example of irrigation systems

Climate Driver Impacting the system (current trends)	Climate Projection	Sensitivity of system	Impact	Adaptive capacity	Vulnerability	Risk	Risk Rating
<b>Rising temperature, erratic precipitation, droughts every 5-6 years</b>	Enhanced frequency + intensification of droughts	Rainfed system	Not enough water in the current system and no water in the projected scenario	Rural development & water resources department active, groundwater maps available	Crop production will be jeopardized	Loss of income of farmers	VH
						Food and nutritional insecurity of the village	VH
						Human well being affected (VH)	VH

#### Training Resources:

Use the associated PowerPoint presentation for this chapter (provided with the Guidebook) and contextualize them as per the village situation that is under focus. Further, refer to Annexure 5 for more information on understanding risks.

### Module 4: Building Climate Resilience at Community Level

The key objective of this module is to enable identification of adaptation strategies and interventions/ actions therein required and prioritization of the same for implementation in the next five years by building it within the cycle of the GPDP. The steps to be followed for this activity will be as follows:

- Based on the projected potential vulnerability, identify adaptation strategies that need to be implemented
- For each adaptation strategy, identify interventions/actions that have to be implemented
- Prioritise actions using criteria such as cost, feasibility etc.
- Map who will do what and within what time line

It is important that GPPFT members and line departments are present during this interaction. They together will come up with effective climate change adaptation actions required as against the vulnerability and risk identified in the previous module.

It may be noted that ongoing climate variability is already leading to implementation of some adaptation actions. Therefore **it is important for the GPPFT to understand the implications of future climate change projections** (refer back to chapter on Climate Change and Vulnerability). Based on this additional adaptation actions required will be identified.

An example of **additional adaptation strategies due to climate projections** is provided below including mapping of adaptation actions and role of each participant in the implementation process. The same process can be used for other vulnerabilities identified to come up with a comprehensive plan for addressing climate change vulnerability in the village under focus.

**Table 8:** Adaptation strategy, Actions, Prioritisation, Timeline & Responsibilities

Actions to be implemented	Timeline	Who will do what
<b>Formulate, train and implement village policy on conjunctive use of water</b>	Year 1: April 30th	Gram Panchayat
<b>Map village physiography and runoff</b>	Year 1: Dec 31st	Water Resources Department
<b>Supply side and demand side water assessment and water budgeting</b>	Year1: Dec 31st	Water resources department in consultation with communities.  Assessment of water consumption by user at the village level to be undertaken to decide the minimum allocation of water by user
<b>Conservation plan and implementation of the same for all existing water bodies</b>	Year 1-5	Forest Department
<b>Assessment of number of sprinklers and deployment of sprinklers</b>	Year 1: June 30th	Agriculture Department
<b>Rooftop rainwater harvesting in community buildings</b>	Year 1: By Dec 30th	Rural Development Department

### Training Resources

Refer to the presentation on Guidance on Integrating Climate Change Adaptation in Development at Gram Panchayat Level provided with the Guidebook along with the brief literature summary in Annexure 5 (part H).

## Module 5: Accessing Resources for Building Climate Resilience at the Community Level

The GPPFT is aware of the funds that are available through the programmes in the village.

Additional funding might come from the Corporate Social Responsibility (CSR) funds of companies and if any bilateral or multilateral funding opportunities are available in the region. For this to be accessed, the funding requirement has to be first worked out by the GPPFT and then the budgeted actions have to be allocated to the fund that can be accessed.

The trainer has to ensure GPPFT representation including that of departments, CSR funders and the NGOs in this training. The departmental representatives should take special interest in this session as they can indicate the programme funds that can be disbursed immediately or planned for in the future. The CSR representative can commit funds for some of the adaptation interventions. Additionally the NGO representative can support the village by scouting for funds from other sources.

Taking forward Table 9 for ascertaining exact actions for adapting to climate change risks and vulnerabilities, some columns will be further added. These columns will ascertain the budgetary requirement and source of funding. Some of the source of funding, among others, can be:

- Programmes of the government (central or state),
- CSR funds to be made accessible by the CSR foundation working in the area and
- Fund that the District Collector thinks can be made available such as the fund created due to cess on mines in that area, or
- Disaster Management funds
- MPLAD funds

**Table 9:** Guidance for ascertaining the finance requirement

Intervention	Ascertain requirement	Per unit cost norm	Estimate total cost (Rs)	Map the probable scheme/ other sources of for Funding
<b>Formulate, train and implement village policy on conjunctive use of water</b>				
<b>Map runoff for the village physiography. Divert runoff for groundwater recharge</b>	Study for the entire village	-		
<b>Supply side and demand side water assessment and water budgeting</b>	For all uses of water in the village			
<b>Conservation of existing water bodies</b>	All identified water bodies			
<b>Assessment of number of sprinklers and deployment of sprinklers</b>				
<b>Rooftop rainwater harvesting</b>				

### Training Resources

- Use “Gram Samvaad” a citizen-centric mobile app developed by Ministry of Rural Development provides a single-window access to gram panchayat-wise information on objectives of the scheme, key features, resources available, physical progress, beneficiary lists and other citizen-relevant information under all rural development schemes and the grants under 14th Finance Commission.
- See GPDP guidance 2018 for details of types of programmes and funds available to villages for funding their development plans.

## Module 6: Integrating Gender perspectives into Climate Change Adaptation

Several studies across the globe point to the fact that women face more acute and differential adverse impacts due to burgeoning challenges of climate change, environmental degradation, distress migration and natural calamities, further widening the existing gender gaps in the society. In the Indian context, the special emphasis on eradicating gender disparity becomes more pronounced as the 2018 HDR Update by UNDP ranked India at the rank of 130 (among 189 countries) with respect to the gender inequality index (UNDP, 2018). Thus, making it imperative to incorporate gender concerns into development planning and implementation at all levels of governance.

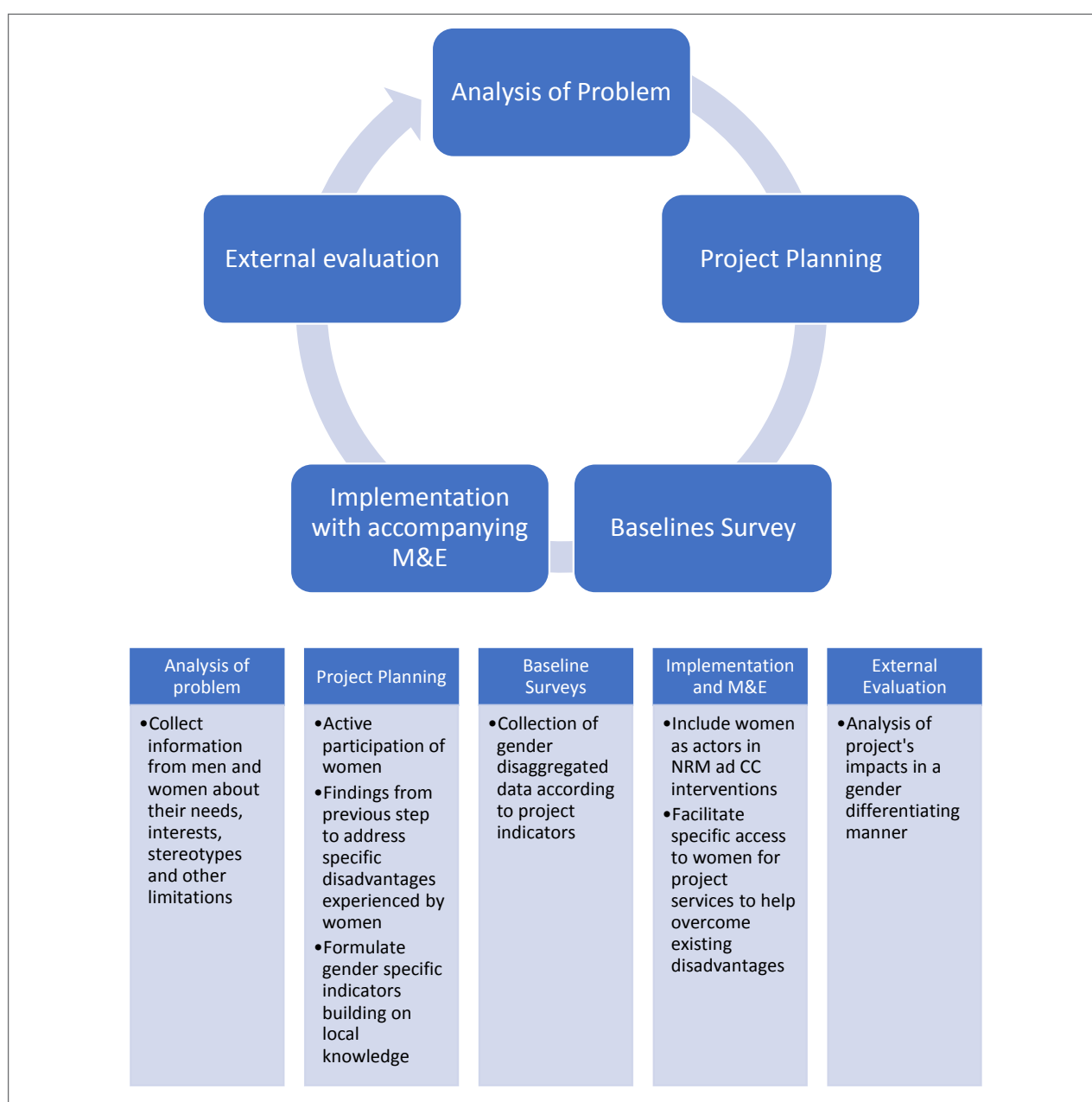
The trainers need to gain an understanding of the gender inequalities in the state context. They can refer to Annexure 5 (part E) for the same. Further, they need to address the relevance of gender policies of relevant international funds as well as national and state level programmes and schemes and their on ground implications. The key objectives of this component is to deliver information on the following aspects:

- Gender and climate change in the state context, accompanied by facts and figures wherever possible
- Integration of gender perspective into project implementation and its long term effects

### Case Study: Women's trouble with the State Forest Policy

Medicinal plants are extremely popular with women in Himachal because they can be used domestically and have a good market in the pharmaceutical industries. Yet, the State policy does not prioritise fodder or fuelwood trees. Women said the large-scale plantation of chir (pine) trees by the forest department for its timber has led to loosening of the soil and lowering of the water table so it is difficult for broad-based leafy trees that provide them with fodder and fuelwood to grow. Despite women's mandated participation by the guidelines, forest cover has decreased and the firewood crisis has grown.

**Source:** Kapoor, Aditi. 2011. *Engendering the Climate for Change: Policies and Practices for Gender-just adaptation*. Alternative Future, Development Research and Communication Group. <http://www.alternativefutures.org.in/userfiles/Engendering%20the%20Climate%20for%20Change.pdf>



**Figure 19:** Integrating gender perspective at project level (GIZ, 2013)

## Module 7: Monitoring & Evaluation (M&E) of Climate Adaptation Actions

### Learning Elements

- M&E activities for each adaptation action is defined
- M&E of identified adaptation actions are integrated within the M&E framework governed by the Panchayat Enterprise Suit (PES) developed by the Rural Development Ministry

The trainer will carry out the following activities with the trainees:

- The M&E should have indicators for output, outcomes and impacts.
- The M&E steps have to be integrated within the M&E framework provided in the GPDP guidance 2018. The M&E is supported by the PES that constitutes of
  - Plan Plus – enables development of GPDP
  - Action Soft - tracks progress of monetary and physical progress of work
  - PRIA Soft- Captures expenditure details
  - Asset directory – Maps all assets (GIS with geo tagging)
  - Area Profiler- socio-economic, physiography and natural resources profile and details of Elected Representatives & Panchayat Functionaries etc.
- Social Audits through the GPDP: Gram Sabha should have audits done by a mix of representatives of women SHGs, Mahila Sabha, marginalised communities, literacy workers, ASHAs, teachers, Anganwadi workers, Rozgar sevaks, VHSNC and Women's Group should actively monitor the implementation of GPDP. Further, video recording and documentation of all interventions should be available to the public.

### Training Resources

Refer to Annexure 5 (part H) for more details.

For further details on PES for rural India see <http://gdpd.nic.in/downloadNew.html>

## 5.5 Training Plan

The training programme for PRIs at village and block level will be 6 hours long with sessions on the modules as discussed above.

- Module 1: Introductory Activities
- Module 2: Setting the Climate Change and Development Context
- Module 3: Identifying Climate Risks and at Gram Panchayat Level
- Module 4: Building Climate Resilience at Community Level
- Module 5: Accessing Resources for Building Climate Resilience at the Community Level
- Module 6: Gender and climate Change
- Module 7: Monitoring and Evaluation of Adaptation Actions

An exhaustive training plan with details on session objectives, duration, methodology to be followed, and the materials required is given in Annexure 4 (C).

## Annexure 1: Category of decision makers/policy makers for sensitization at state level

**Table 10:** Decision makers to be trained at Tamil Nadu

Himachal Pradesh		
Name	Designation	Email
	MLAs/MPs	
	Chief Secretary	
	Addl. Chief Secy. cum Principal Secy. to Chief Minister	
	Addl. Chief Secy. (Information & Public Relations)	
	Addl. Chief Secy. (Public Works)	
	Financial Commissioner (Revenue)	
	Addl. Chief Secy. (Finance, Planning, Economics & Statistics, Twenty Point Programme)	
	Addl. Chief Secy. (Printing & Stationery, Labour & Employment, Social Justice & Empowerment)	
	Addl. Chief Secy. (Ayurveda, Cooperation, Animal Husbandry, RPG) Financial Commissioner (Appeals)	
	Addl. Chief Secy. (Home, Industries, Technical Education)	
	Addl. Chief Secy. (Health & Family Welfare, Personnel, Training, FA, Horticulture, Env. Sci. & Tech.) Chairman HPSPCB	
	Principal Secy. (MPP & Power, NCES, Urban Dev., Town & Country Planning, Housing) Chairman HP Appellate Sales Tax Tribunal	
	Principal Secy. (Education)	
	Principal Secy. (Tribal Development, Food Civil Supplies & Consumer Affairs, Agriculture)	
	Secretary (Irrigation & Public Health)	
	Secretary (Rural Development, Panchayati Raj, Proj. Mon. to Chief Minister, General Admn., Parl. Affairs, Secretariat Admn., Sainik Welfare)	
	Secretary (Finance)	

## Annexure 2: Mapping departments, mandates, developmental programmes, and programme scopes

Table 11 below gives the longlist of departments across these sectors at State/District level. Tables 12 gives the format for capturing the function and missions of the identified departments in these four States along with key policies, programmes and schemes which contribute towards climate change adaptation. It further captures the contact details of the relevant officer handling these.

**Table 11:** List of Climate Adaptation Relevant Departments in Himachal Pradesh

Sector	Department
<b>Water Resources</b>	<ul style="list-style-type: none"> <li>■ Department of Irrigation &amp; Public Health</li> <li>■ Department of Health &amp; Family Welfare</li> </ul>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>■ Department of Agriculture</li> <li>■ Department of Animal Husbandry</li> <li>■ Department of Fisheries</li> <li>■ Department of Cooperation</li> <li>■ Department of Food, Civil Supplies &amp; Consumer Affairs</li> <li>■ Department of Horticulture</li> </ul>
<b>Forestry &amp; Biodiversity</b>	<ul style="list-style-type: none"> <li>■ Forest Department</li> <li>■ Tribal Development Department</li> </ul>
<b>Rural Infrastructure</b>	<ul style="list-style-type: none"> <li>■ Public Works Department</li> <li>■ Department of Health &amp; Family Welfare</li> <li>■ Department of Panchayati Raj</li> <li>■ State Rural Development Department</li> <li>■ Directorate for the Empowerment of Schedule Castes, Other Backward Classes, Minorities and Specially Aabled</li> <li>■ Tribal Development Department</li> </ul>
<b>Rural Livelihoods</b>	<ul style="list-style-type: none"> <li>■ Department of Panchayati Raj</li> <li>■ Department of Cooperation</li> <li>■ Department of Industries</li> <li>■ State Rural Development Department</li> <li>■ Directorate for the Empowerment of Schedule Castes, Other Backward Classes, Minorities and Specially Aabled</li> <li>■ Tribal Development Department</li> <li>■ Department of Women &amp; Child Development</li> </ul>
<b>Overarching – Planning &amp; Implementation</b>	<ul style="list-style-type: none"> <li>■ Department of Planning</li> <li>■ Department of Environment, Science &amp; Technology</li> <li>■ Department of Revenue</li> <li>■ Department of Treasuries Accounts and Lotteries</li> <li>■ Directorate of Economics &amp; Statistics</li> <li>■ Finance Department</li> </ul>

**Table 12:** Roles and Responsibilities of the Climate Adaptation Relevant Departments

CCA Relevant Department	Mission and Key Functions of the Department	Key CCA Relevant Policies, Programmes and Schemes of the Department	Scope of the programmes	Name of Programme/ Agency Head	Email and Mobile Number

## Annexure 3: Agenda of the Training at State/District

### Integrating Climate change adaptation in Development at State/District level

Dates: from date to date

Venue and Locality:

### Background

The Indian economy is heavily dependent on climate sensitive sectors namely, agriculture, forest, water, tourism, animal husbandry etc. About 60% of the population is directly thriving on agriculture and forest resources. As the climate continues to change due to anthropogenic causes, it is impacting the natural resources and hence the produce of the land and the livelihood of the dependent communities. The CCA-RAI programme (Climate Change Adaptation in Rural Areas in India) of GIZ has been undertaking contextualised climate change adaptation interventions at the policy, programme and implementation level across various States in India. Through the programme implementation phase it has been increasingly realised that natural resource based programmes need sensitive planning for ensuring integration of climate change adaptation strategies at the local context where it is being implemented. Climate sensitive planning can be done if the planners at the apex level of governance and the implementers down the line are aware of the process through which it can be done.

A series of Training Needs Assessments (TNA) have been carried out by GIZ since then and it has been concluded that for integrating climate change in the state, district, block, and village level planning it is essential to develop a standard practitioner's guidebook that identifies the opportunities and the methods required to make a certain program climate resilient. For this it is also necessary to impart training to targeted groups on the same and train master trainers who can take the work forward to the targeted groups of officials across the State governance hierarchy who implement these programmes at the local level.

In this regard as a part of a project supported by GIZ, ..... is organizing a training programme on “**Integrating Climate Change in Development Planning**” from XX to XX Month, Year at XXXX,

### Audience of the Training

List the list of departments invited

### No. of days of training

Four

### Illustrative Agenda

#### Day 1:

Time	Topic	Facilitator/resource person
<b>Module 1: Inaugural Session</b>		
09:30-10:00	Registration	
10:00-10:05	Welcome	
10:05-10:20	Address	
10:20-10:30	About the Programme	
10:30-11:00	TEA and introductory Ice breaker	Facilitator and Participants

Module 2: Introduction to the Training Programme and Setting the Context		
11:00-12:00	Observed climate trends and projections	Climate Expert
12:00-12:45	Context for Climate Change & Development	Expert
12:45-13:00	Responses to Climate Change	CC Focal Point in the state
13:00 -14:00	LUNCH	
Module 3: Climate Change Impacts, Risks and Vulnerabilities of the State		
14:00-15:30	Panel Discussion on Climate Change Impact	Experts
15:30-15:45	TEA	
15:45-16:15	Assessing climate risk and vulnerability	Facilitator
16:15-16:30	Group work	Group work
16:30-17:00	Group Presentation	Group representative

## Day 2:

Time	Topic	Facilitation
Module 4: Field Trip		
Full day	Field Visit*	By facilitator

## Day 3: Date

Time	Topic	Facilitator/resource person
Module 4: Identifying and prioritising Climate change adaptation options and mapping existing programmes		
10:00-10:15	Recapping Day 1 Proceedings	
10:15-10:45	Adaptation options and prioritization	Facilitator
10:45-11:00	TEA	
11:00-12:30	Group work	Participants
12:30-13:00	Group Presentation	Group representative
13:00-14:00	LUNCH	
14:00-15:00	Films on climate change and giving examples on various aspects of CC adaptation	To be provided by facilitator
15:00-15:15	TEA	
Module 5: M&E for CCA projects		
15:15-15:30	Frameworks for adaptation M&E	Facilitator
15:30-16:15	Group work	Participants
16:15-17:00	Group Presentation	Group representative

**Day 4:**

Time	Topic	Facilitation
<b>Module 6: Climate change adaptation Finance</b>		
10:00-10:30	Climate change adaptation financing options	Facilitator
<b>Module 7: Designing a climate change adaptation project</b>		
10:30-11:30	Presentation on PDD key elements	
11:30-12:30	Group work on drafting key elements of PDD	Participants
12:30-13:00	Presentation	Group presentation
13:00-14:00	LUNCH	
14:00-14:15	Feed back	Group representative
14:15-14:30	Feed back	Individual forms
14:30-15:00	Conclusion and presentation of certificates	Facilitator

## Annexure 4: Training Plans

### PART A

**Table 13:** Complete training plan for State-level Policymakers in Himachal Pradesh

Module & Session	Timing of the Session	Session Objective	Methodology	Materials/ Facilitator
<b>Module 1: Recent Developments in Climate Change Science and Policy Paradigm</b>				
<b>Session: Climate Change linking with NDC and SDGs</b>	35 min	History and significance of SDGs and the co-benefits with climate change adaptation. Provide the key takeaways from the Paris Agreement including its objective, NDCs and other important mechanisms introduced in the Agreement. Further India's NDCs will be presented and the pathway through which this will be achieved.	This will be a power point presentation.	Projector, pointer, screen, laptop, mic
<b>Module 2: Climate Risks and Adaptation Needs of the State</b>				
<b>Session A – An overview of the climate change scenarios and key impacts in the short, medium and long term. Potential liabilities and losses through sectoral case studies.</b>	35 mins	Establish an overarching understanding of national and state level impacts of climate change. Provide an overview of the potential negative impacts of climate change through various case studies	PowerPoint Presentation by the trainer or a resource person  15 mins session;	Projector, pointer, screen, laptop, mic
<b>Session B – Sector-wise climate adaptation measures required in the respective state or district</b>	45 mins	Establish an understanding of the need for retrofitting of existing policies and/or introduction of new policies	The session would initially have a presentation by the trainer followed by an interactive session to identify risks, vulnerabilities, existing policies, and the need for new policies. The interactive session would be conducted with the help of a flip chart for explanations	PowerPoint presentation by the trainer, Flip Chart to be used by trainer for the interactive session to be conducted
<b>Session C – Role of NAPCC and SAPCC</b>	30 mins	Help develop an understanding of the importance of SAPCC in planning for climate change adaptation		Projector, pointer, screen, laptop, mic

Module & Session	Timing of the Session	Session Objective	Methodology	Materials/ Facilitator
<b>Module 3: Resource Requirement for Integration of Climate Adaptation in State's Plans</b>				
<b>Session – Climate finance requirements and potential financing sources</b>	20 mins	Establish understanding of Climate Budget Tagging along with numerous channels and options for financing of climate change adaptation projects	PowerPoint Presentation by the trainer. Print out of Executive Summary of CBT Exercise  15 mins session;	Projector, pointer, screen, laptop, mic
<b>Q&amp;A</b>	10 min			

## PART B

**Table 14:** Complete training plan for State and District-level Decision makers in Himachal Pradesh

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 1: Introductory Activities</b>				
<b>Registration</b>	30 min	Register all participants	Make them sign attendance sheet. One attendance sheet should be circulated every day of the training.	Registration desk, Attendance sheets (Name, organisation, email, mobile number), pen
<b>Welcome</b>	5 min	Host welcomes participants to the programme	Through a 5 minute speech	Microphone
<b>Address</b>	15 min	To talk in general on climate change and its implication on the economy and the need for climate resilient planning	Through speech	Microphone (to be delivered by secretary/ director of the institution where the CC cell is located).
<b>About the programme</b>	10 min	Establish the goal and objectives of the programme and describe the components of the programme and the outcome expected at the end of each Module and expected outcome of the programme	Through PPT presentation.	Overhead projector, projection board, laptop, Pointer, microphone, sound system  To be delivered by the trainer
<b>Introductory ice-breakers</b>	30 mins	Get to know the participants	Introduce an ice-breaker. The trainers start it off by introducing themselves. Then each participant is asked to follow the same process	Two hand held Mics and sound system  To be delivered by the trainer

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 2: Setting the Climate Change and Development Context</b>				
<b>Session A: Climate change observed trends and projections + Q&amp;A</b>	60 mins	Present the climate change trends globally, at India level and then detailed observations and trends at the state and district level covering parameters that are important for various sectors	Presentation through PPT : 30 minutes  Q&A: 30 minutes	To be delivered by expert  Overhead projector, Microphone, Pointer
<b>Session B: Climate Change in a Development Context</b>	45 mins	Establish an understanding about climate change impacts and adaptation needs. Highlight the importance of building climate resilience given its immense impact on economic growth and development targets	Power point Presentation by the trainer. The content should be customized to provide local context on the climate impacts where the training is being organized.	Laptop, mic, sound system, projector and projection screen  Understanding to be delivered by the trainer
<b>Session C: Climate change and gender</b>	45 min	Develop an understanding of the need to address the issue of gender in the climate change context and its impacts  Facilitated discussion to understand gender differential climate change impacts in the state	Power point Presentation by the trainer. The content should be customized to provide local gender context and the related climate impacts.	Laptop, mic, sound system, projector and projection screen
<b>Session D: Response to Climate Change</b>	15 mins	Provide an overview of State Action Plan on Climate Change including its development process and a summary of the proposed plan.  And  Any other initiative taken up by the government as a follow up to the state action plan	20 mins for PowerPoint Presentation by a local expert on the SAPCC: Listing the Missions/Sectors covered under the Plan, adaptation strategies suggested by sector, Institutional arrangement proposed for implementation of the SAPCC and funding requested implementation.  10 mins of Questions & Answers	Laptop, mic, sound system, projector and projection screen  To be presented by focal point climate change in the State

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 3: Evaluating Climate Change Impacts, Risks and Vulnerabilities at the State and District Levels</b>				
<b>Session A: Panel Discussion on Impact of Climate Change on the State and examples of adaptation strategies</b>	90 mins	<p>Sectoral experts share their insights and learning on the risks and opportunities posed by climate change in their sector. The sectors can be water resources, agriculture, horticulture, animal husbandry, fisheries (inland and coastal), human health, coastal ecosystems, rural infrastructure (energy and waste) and rural livelihoods.</p> <p>Suggestive guided questions to the panellists provided in Annexure 6</p>	<p>60 mins moderated panel discussion</p> <p>30 mins of Questions &amp; Answers</p>	<p>Seating arrangement on the dias for a panel discussion, mics, sound system, laptop, projector and projection screen</p> <p>Experts to be invited</p>
<b>Session B: Climate Risk Assessment – Tools and Techniques</b>	30 mins	Develop an understanding about the concepts of climate vulnerability and risk assessment and the approaches.	<p>20 min Power Point Presentation by the trainer. The content should be customized to provide local context on the climate impacts where the training is being organized. Also, the presentation should include case studies and examples that are relevant to the local context.</p> <p>10 mins of Questions &amp; Answers</p>	<p>Laptop, mic, sound system, projector and projection screen</p> <p>To be presented and facilitated by the trainer</p>
<b>Group Activity: Climate Risk Assessment</b>	90 mins	Divide participants into groups on climate vulnerable sectors. Engage the groups to apply the concepts learned for their assigned climate vulnerable sector.	<p>60 mins for group work</p> <p>30 mins for presentation by each group</p>	<p>Pin boards (1 for each group), pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system</p> <p>To be facilitated by the trainer</p>

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 4: Field visit</b>				
<b>Field visit to a climate vulnerable community</b>  <b>Or</b>  <b>To an institution work towards building climate resilience of a community or sector</b>	Full day	<p>Understand the implications of climate change on communities and demonstration of actions being taken to build climate resilience.</p> <p>and/or</p> <p>The importance of building climate resilience through various approaches. Example visit to technology centers such as CRIDA extension center may show case new technologies that can bring in climate resilience in agriculture sector.</p> <p>See Annexure 7 for some indicative issues need to be queried in the field visit</p>	Guided tour	Transportation+ flip chart + markers
<b>Module 5: Climate Adaptation Planning</b>				
<b>Session A: Assessment of Adaptation Gaps and Selection of Actions for Implementation</b>	30 mins	<p>Develop an understanding about:</p> <p>Process for assessing the adaptation gaps - application of climate lens approach</p> <p>Methods for identification and prioritization of adaptation actions</p>	<p>20 min Powerpoint Presentation by the trainer. The content should be customized to provide local context on the climate impacts and risks identified. Also, the presentation should include case studies and examples on climate adaptation planning by other States.</p> <p>10 mins of Questions &amp; Answers</p>	Laptop, mic, sound system, projector and projection screen, laser pointer
<b>Group Activity: Climate Adaptation Planning</b>	90 mins	Engage the groups formed under the previous module to take forward the work they have done on climate risk assessment. Ask them to identify and prioritise adaptation actions for the risks identified by their group.	<p>60 mins for group work</p> <p>30 mins for presentation by each group</p>	Pin boards (1 for each group), pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 6: Monitoring and Evaluation</b>				
<b>Monitoring and Evaluation frameworks for climate adaptation</b>	20 mins	Introduce the concept of Monitoring & Evaluation for climate adaptation and the frameworks available for the same.	Powerpoint Presentation by the trainer	Laptop, mic, sound system, projector and projection screen
<b>Group Activity for M&amp;E</b>	45 mins	Engage the groups to develop a set of indicators for monitoring the climate risks, assessing the performance of the adaptation actions overtime and evaluating the outputs, outcomes and impact achieved	Group work	Pin boards (1 for each group), pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system
<b>Session C: Presentation by Groups</b>	45 mins	Presentations by groups and Discussions	Group representative making group presentation	Microphone
<b>Module 7: Financing of Climate Adaptation</b>				
<b>Session A: Financing of Climate Adaptation and Preparation of Project Proposals</b>	30 mins	Present the range of climate finance options available for funding climate adaptation strategies, including international, national and local sources. Explain the process to be followed in developing coherent, bankable project proposals for key climate funds at the international and national level.	20 mins of Powerpoint Presentation by the trainer  10 mins of Questions & Answers	Laptop, mic, sound system, projector and projection screen, laser pointer
<b>Session B: Typical PDD for CC adaptation</b>	20 mins	Presentation and guidance on the processes involved in applying for financing opportunities e.g. NAFCC	Through PPT presentation	Laptop, mic, sound system, projector and projection screen, laser pointer
<b>Session C: Guided group work</b>	60 mins	The components to be addressed:  Why intervention needed in the context of CC  Subcomponents of the intervention  Implementation arrangement  Budgeting process  M&E framework	Group work and Presentation	Chart paper cut outs, pin board, pins, marker, and microphone

## PART C

Table 15: Complete training plan for Members of Gram Panchayats in Himachal Pradesh

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Registration</b>	30 mins	Register all participants	Make them sign attendance sheet. One attendance sheet should be circulated every day of the training.	Registration desk, Attendance sheets (Name, organisation, email, mobile number), pen
<b>Module 1: Introductory Activities</b>				
<b>Welcome Address</b>	5 mins	To talk in general on climate change and its implication on the economy and the need for climate resilient planning	Speech by the host training institution representative	Microphone
<b>About the programme</b>	10 mins	Establish the goal and objectives of the programme and describe the components of the programme and the outcome expected at the end of each Module and expected outcome of the programme	Through PPT presentation.	Overhead projector, projection board, laptop, Pointer, microphone, sound system  To be delivered by the trainer
<b>Introductory ice-breakers</b>	15 mins	Get to know the participants	Introduce an ice-breaker. The trainers start it off by introducing themselves. Then each participant is asked to follow the same process	Two hand held Mics and sound system  To be facilitated by the trainer
<b>Module 2: Setting the Climate Change and Development Context</b>				
<b>Session B: Climate Change impacts and Adaptation in a Development Context</b>	30 mins	Establish an understanding about climate change impacts and adaptation needs. Highlight the importance of building climate resilience given its immense impact on economic growth and development targets	20 mins - Power point Presentation by the trainer. The content should be customized to provide local context on the climate impacts where the training is being organized.  10 mins – Questions & Answers	Laptop, mic, sound system, projector and projection screen
<b>Module 3: Identifying Climate Risks and at Gram Panchayat Level</b>				
<b>Session A: Mapping of Village Resources</b>	25 mins	Map all the resources available in the village	Group discussion facilitated by the trainer	Flip chart or chart paper, marker pens, easel

Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Session B: Climate Risk Assessment</b>	20 mins	Develop an understanding about the concepts of climate vulnerability and risk assessment	15 mins - Action learning exercise by the trainer. The content should be customized to provide local context on the climate impacts where the training is being organized. Also, the presentation should include case studies and examples that are relevant to the local context.  5 mins of Questions & Answers	Laptop, mic, sound system, projector and projection screen
<b>Group Activity: Climate Risk Assessment</b>	45 mins	Identify climate vulnerabilities and risks of the village using Focused Group Discussions	Facilitated by the trainer	Pin board, pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system
<b>Module 4: Building Climate Resilience at Community Level</b>				
<b>Session A: Assessment of Adaptation Gaps and Selection of Actions for Implementation</b>	20 mins	Develop an understanding about: <ul style="list-style-type: none"> <li>■ Process for assessing the adaptation gaps</li> <li>■ Methods for identification and prioritization of adaptation actions</li> </ul>	15 min Powerpoint Presentation by the trainer. The content should be customized to provide local context on the climate impacts and risks identified. Also, the presentation should include case studies and examples on climate adaptation planning at the village level  5 mins of Questions & Answers	Laptop, mic, sound system, projector and projection screen, laser pointer
<b>Group Activity: Climate Adaptation Planning</b>	40 mins	Engage the trainees to take forward the work they have done on climate risk assessment. Ask them to identify and prioritise adaptation actions and develop the implementation plan for incorporating these into their GPDP	Facilitated by the trainer	Pin boards, pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system
<b>Module 5: Accessing Resources for Building Climate Resilience at the Community Level</b>				
<b>Session A: Sources for Financing of Climate Adaptation at village level</b>	20 mins	Present the range of climate finance options available to fund climate adaptation actions in the village, including public and private sources. Explain the process to be followed by the Gram Panchayat in accessing these funds	15 mins of Powerpoint Presentation by the trainer  5 mins of Questions & Answers	Laptop, mic, sound system, projector and projection screen, laser pointer

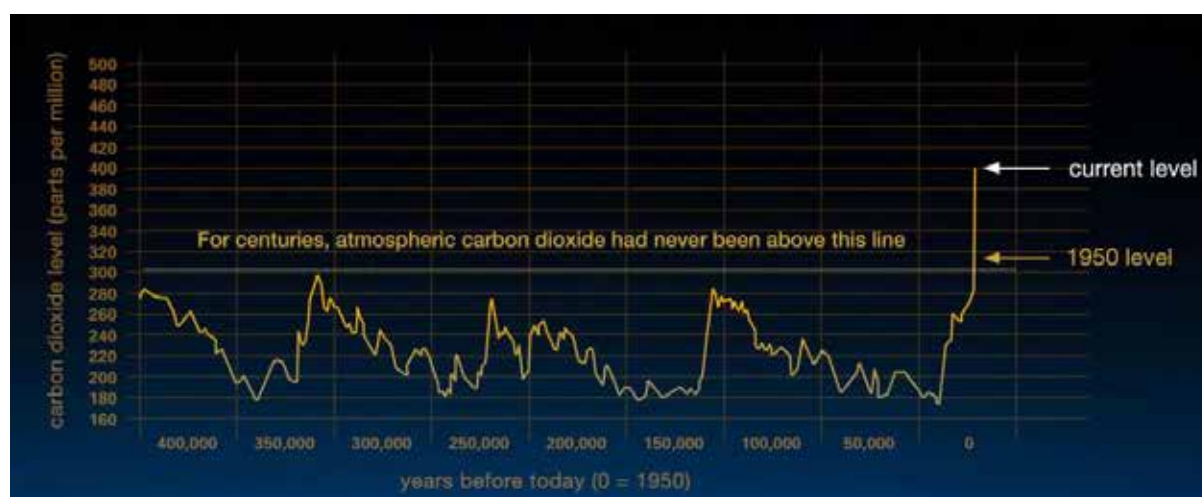
Module & Session	Duration	Session Objective	Methodology	Materials/ Facilitator/ Resource person
<b>Module 6: Gender and climate Change</b>				
<b>Session A: Gender – State Context</b>	20 mins	Discuss the gender disparities in the state and the impacts of climate change on women	10 minutes of Powerpoint Presentation by trainer 10 minutes of guided discussion	Laptop, mic, sound system, projector and projection screen, laser pointer Flex chart, markers
<b>Session B: Incorporating gender perspectives into climate change adaption and current projects</b>	30 mins	Develop an understanding of how to incorporate gender perspective into adaptation and development projects	20 minutes of PowerPoint presentation by trainer 10 minutes of question and answer	Laptop, mic, sound system, projector and projection screen, laser pointer
<b>Module 7: Monitoring and Evaluation of Adaptation Actions</b>				
<b>Monitoring and Evaluation frameworks for climate adaptation</b>	10 mins	Introduce the concept of Monitoring & Evaluation for climate adaptation and the frameworks available for the same.	Powerpoint Presentation by the trainer	Laptop, mic, sound system, projector and projection screen
<b>Group Activity for M&amp;E</b>	30 mins	Engage the trainees to develop a set of indicators for monitoring the climate risks, assessing the performance of the adaptation actions overtime and evaluating the outputs, outcomes and impact achieved	Group work	Pin boards (1 for each group), pins, moderation cards (in 3-4 different colours), marker pens, mics and sound system

## Annexure 5: Supporting Literature

### PART A Understanding climate change

#### What is climate change?

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use”. To learn more about the natural and human drivers of climate change, please visit the IPCC website.



Changes in climate can occur through both **natural** and **human-induced** causes

Changing concentrations of greenhouse gases in the atmosphere (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O)  
Altering the concentrations of aerosols  
Altering the reflectivity of earth's surface by changing land cover.

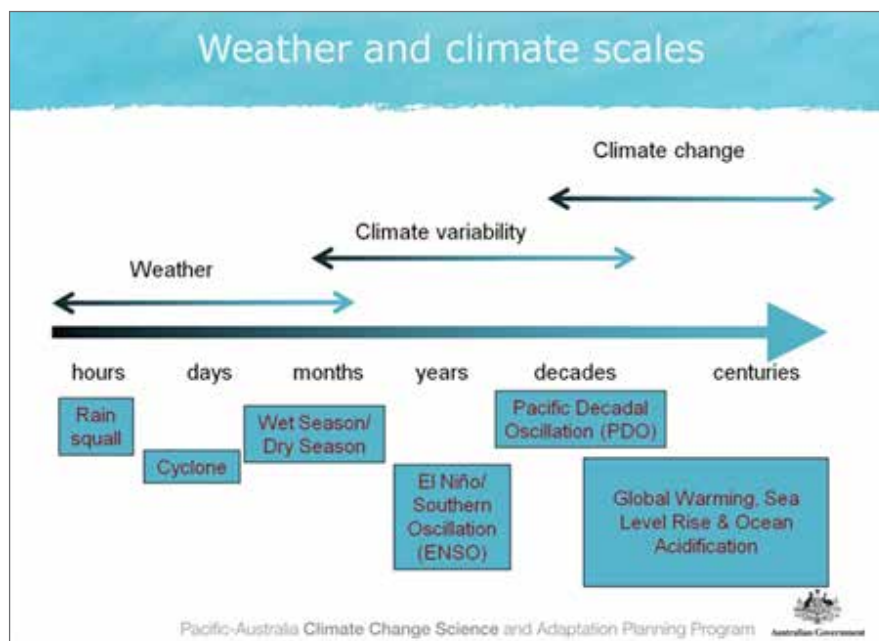


Internal fluctuations that exchange energy, water and carbon between the atmosphere, oceans, land and ice  
External influences on the climate system, including variations in the energy received from the sun and the effects of volcanic eruptions.

**Figure 20:** Changing CO<sub>2</sub> concentrations in the atmosphere through the centuries from presentations for training

The image in the presentation slide above shows the comparison of atmospheric samples contained in ice cores and more recent direct measurements which provide evidence that atmospheric CO<sub>2</sub> has increased since the Industrial Revolution (NASA, 2019).

#### Understanding weather, climate variability and climate change



**Figure 21:** Presentation slide on 'Weather and climate scales'

Weather is the state of the atmosphere at a particular time and place in terms of heat, humidity, clouds, wind, and rain and can vary on a daily, weekly or monthly basis. The weather is what we experience every day.

IPCC defines climate as the average weather in terms of the mean and variability of rainfall, temperatures, humidity, wind etc. over a period of time ranging from months to thousands or millions of years. As per the World Meteorological Organization, the typical period for averaging the variabilities is 30 years (IPCC, 2013).

Climate change refers to the change in the state of climate that can be identified by changes in the mean or variability of properties over an extended period of time. Climate change can be due to natural internal process of external forcing such as modulations in the solar cycle, volcanic eruptions, or persistent anthropogenic changes in the composition of the atmosphere or land use. The UNFCCC in its Article 1 defines climate change as 'a change which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods of time.'

**Figure 22:** IPCC observation of impacts

### IPCC Observations on Impacts

- Global Warming is likely to reach 1.5°C between 2030 and 2053 if it continues to increase at the current rate.
- Impacts on natural and human systems from global warming have already been observed. Many land and ocean ecosystems and some of the services they provide have already changed due to global warming.
- Many terrestrial and freshwater species have shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change.
- Based on many studies covering a wide range of regions and crops
  - Negative impacts of climate change on crop yields in areas they have been growing is observed.
- Non-climatic factors, inequalities and poverty are increasing the vulnerability and exposure to poor.

## PART B Understanding Vulnerability and Risk

### Climate risk and vulnerability assessment

As described under the IPCC AR5 report of the Working Group II, “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. Changes in both the climate system (depicted on left of Figure 22) and socioeconomic processes including adaptation and mitigation (depicted on right of Figure 23) are drivers of hazards, exposure, and vulnerability.”

Figure 23: Presentation Slide on ‘Climate Risk’

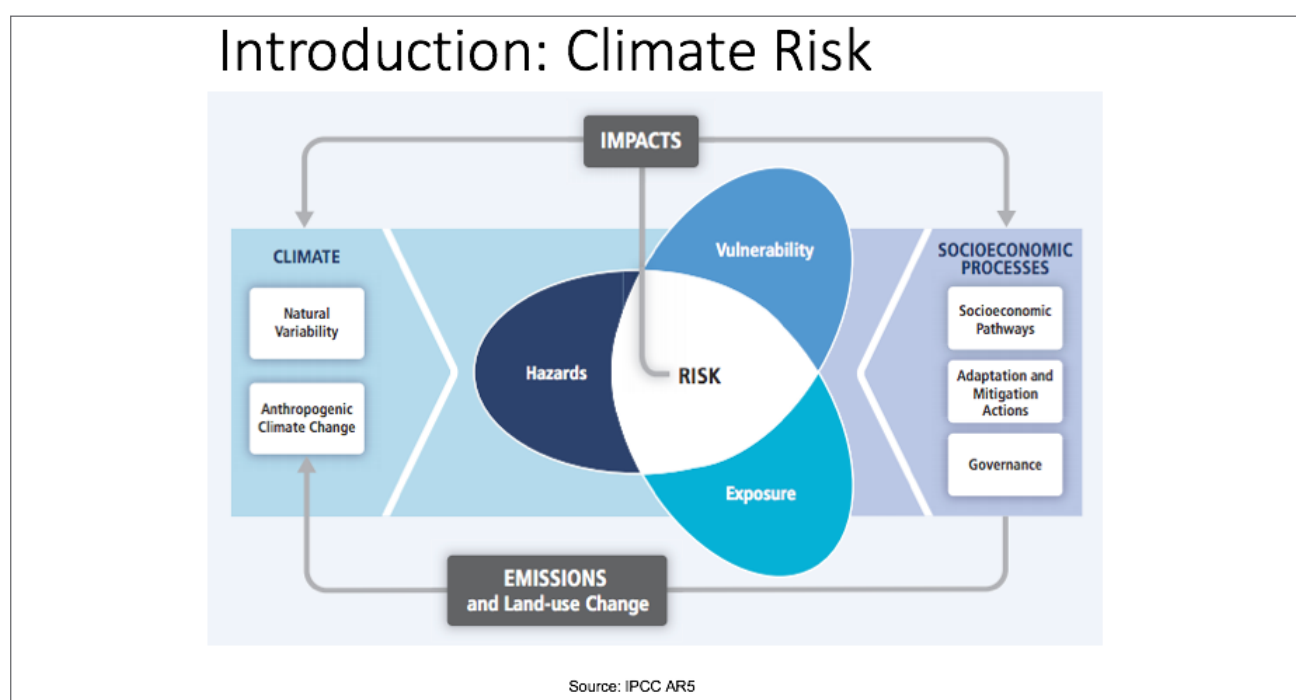
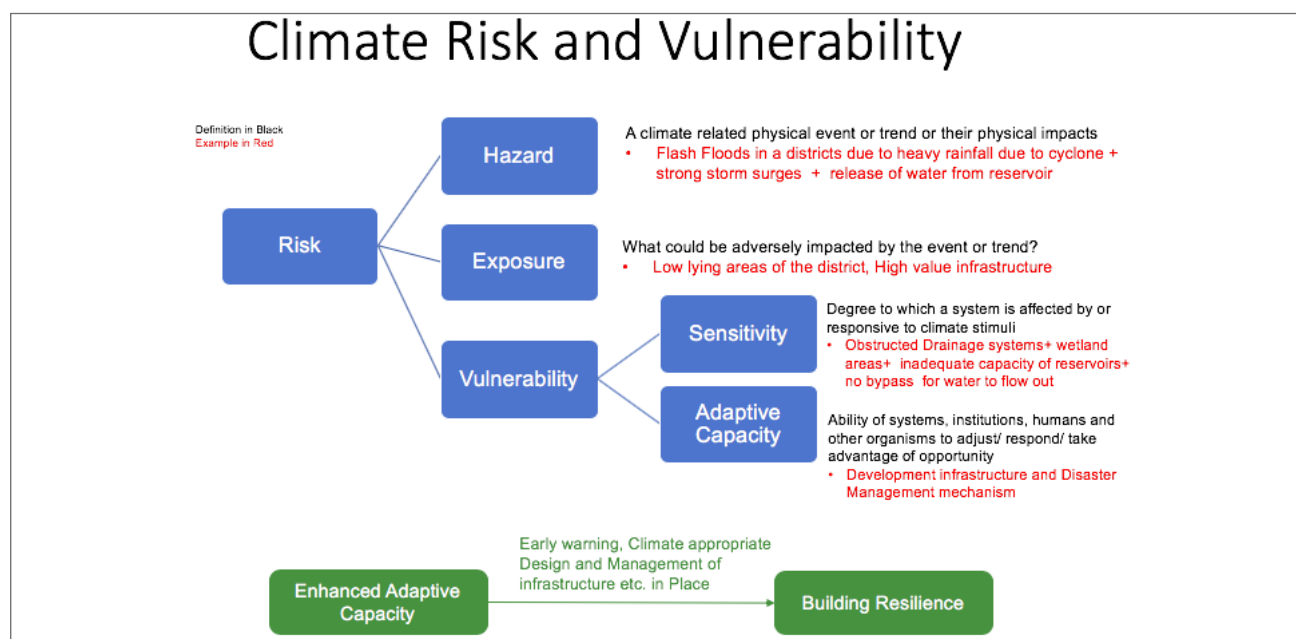
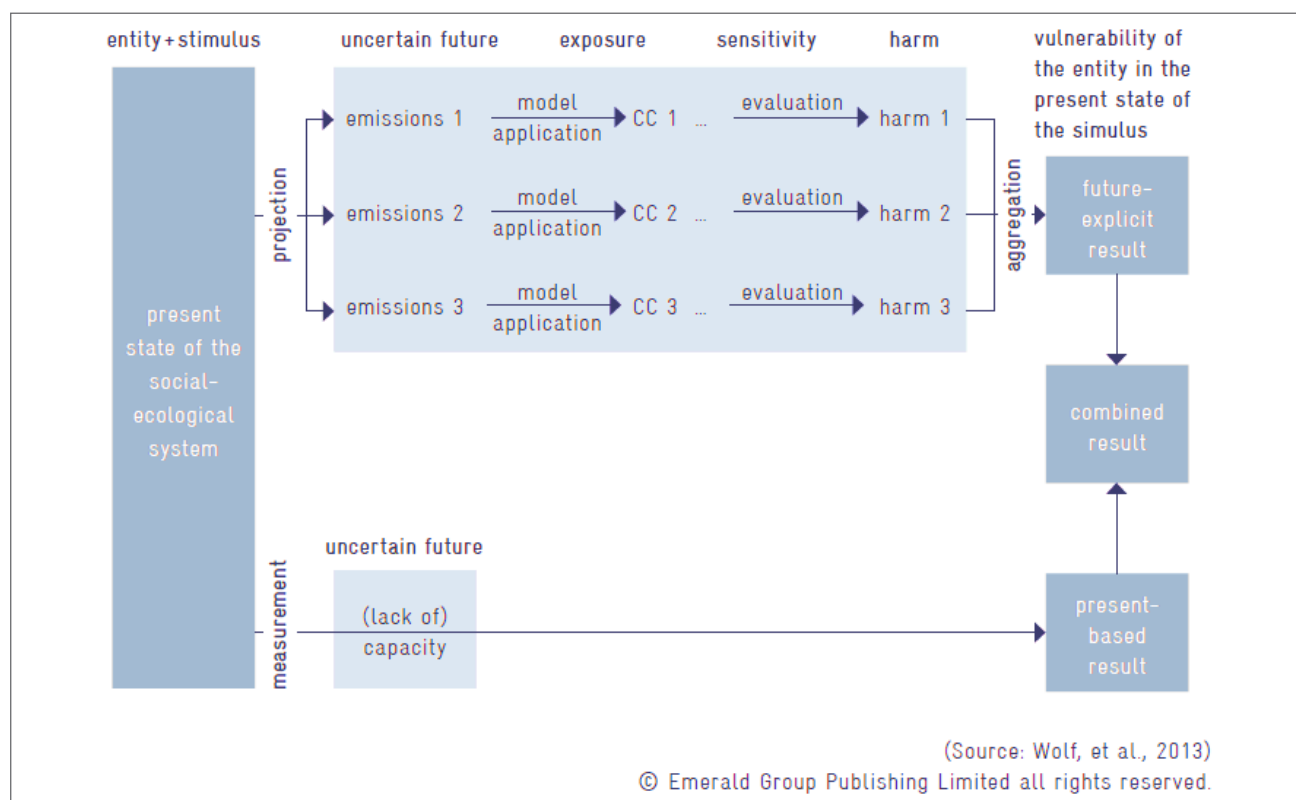


Figure 24: Presentation Slide on ‘Climate Risk and Vulnerability’

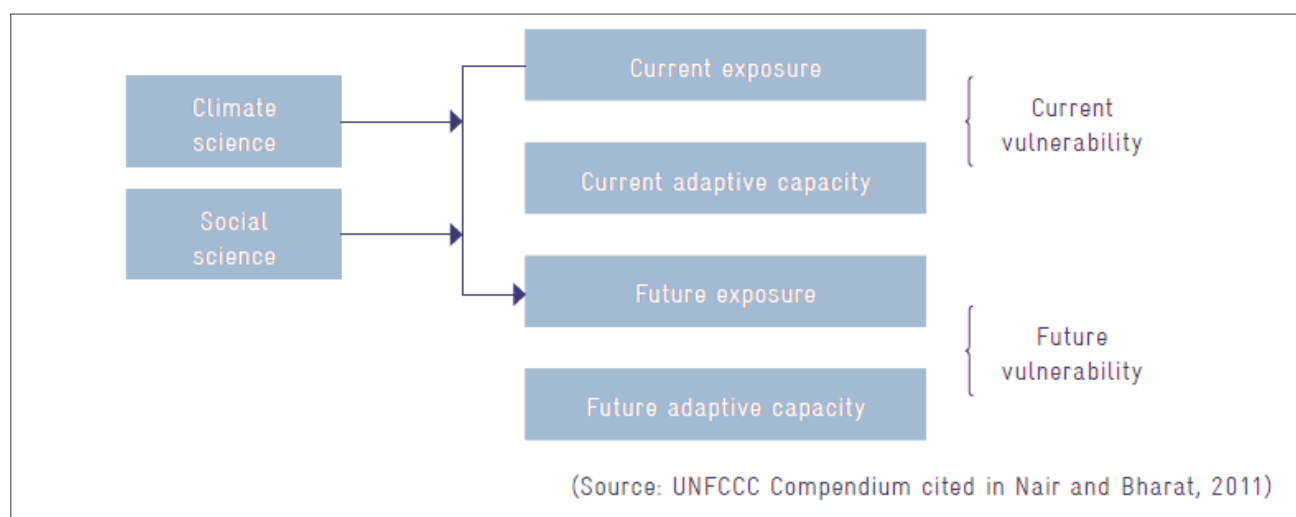


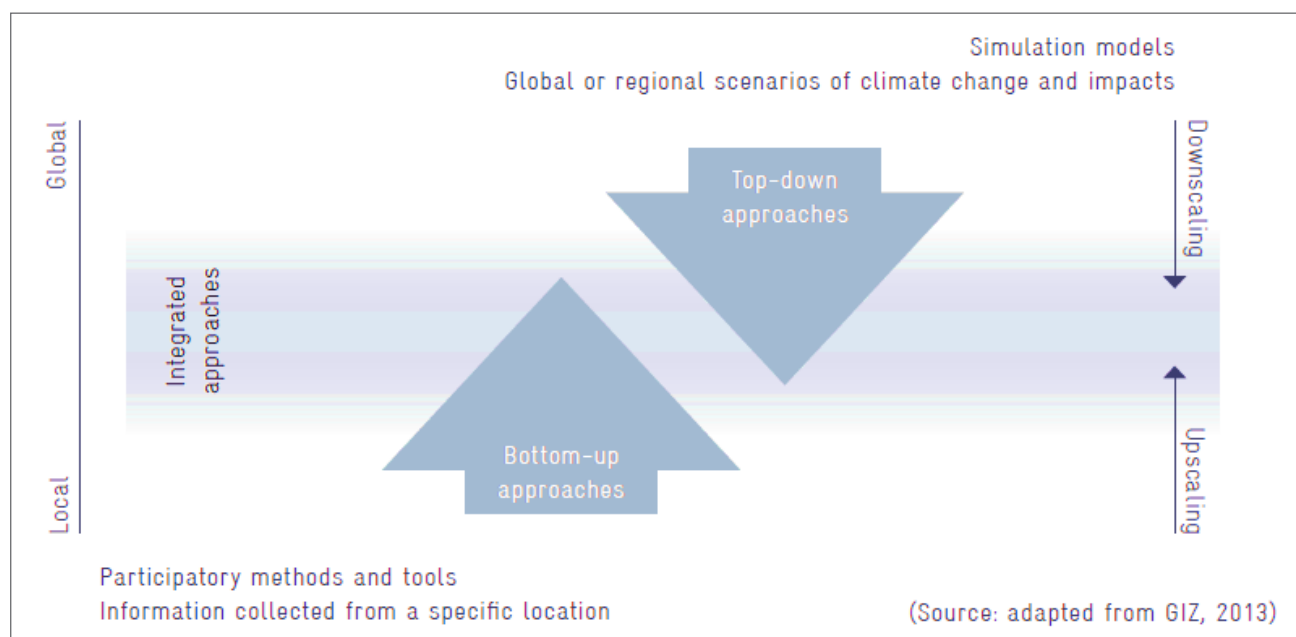
Common approaches for climate vulnerability assessments include the top-down, bottom-up and integrated approaches. The top-down approach begins with an analysis of climate change and its impacts, while the bottom-up approach begins with an analysis of the people affected by climate change. The report title “A Framework for Climate Change Vulnerability Assessments” by GIZ & Ministry of Environment, Forest and Climate Change, Government of India provides a good overview on how climate vulnerability assessments can be planned along with India specific case studies. Further, the DST in partnership with the 12 Himalayan States has been able to jointly produce a first of its kind vulnerability map and report for the entire Himalayan region under the Indian Himalayas Climate Adaptation Programme (IHCAP) (DST, 2018).

**Figure 24:** Presentation Slide on ‘Vulnerability Assessment framework’



**Figure 25:** Presentation Slide on ‘Vulnerability Assessment framework’





**Figure 26:** Presentation Slide on ‘Vulnerability Assessment Tools’

Climate risks determined through analysis of hazards, exposure, sensitivity, impacts and adaptive capacity need to be prioritized in order to develop adaptation strategies and implementation plans for the same. The UNFCCC’s Technical Guidelines for National Adaptation Plan, lists the following common criteria for ranking climate risks:

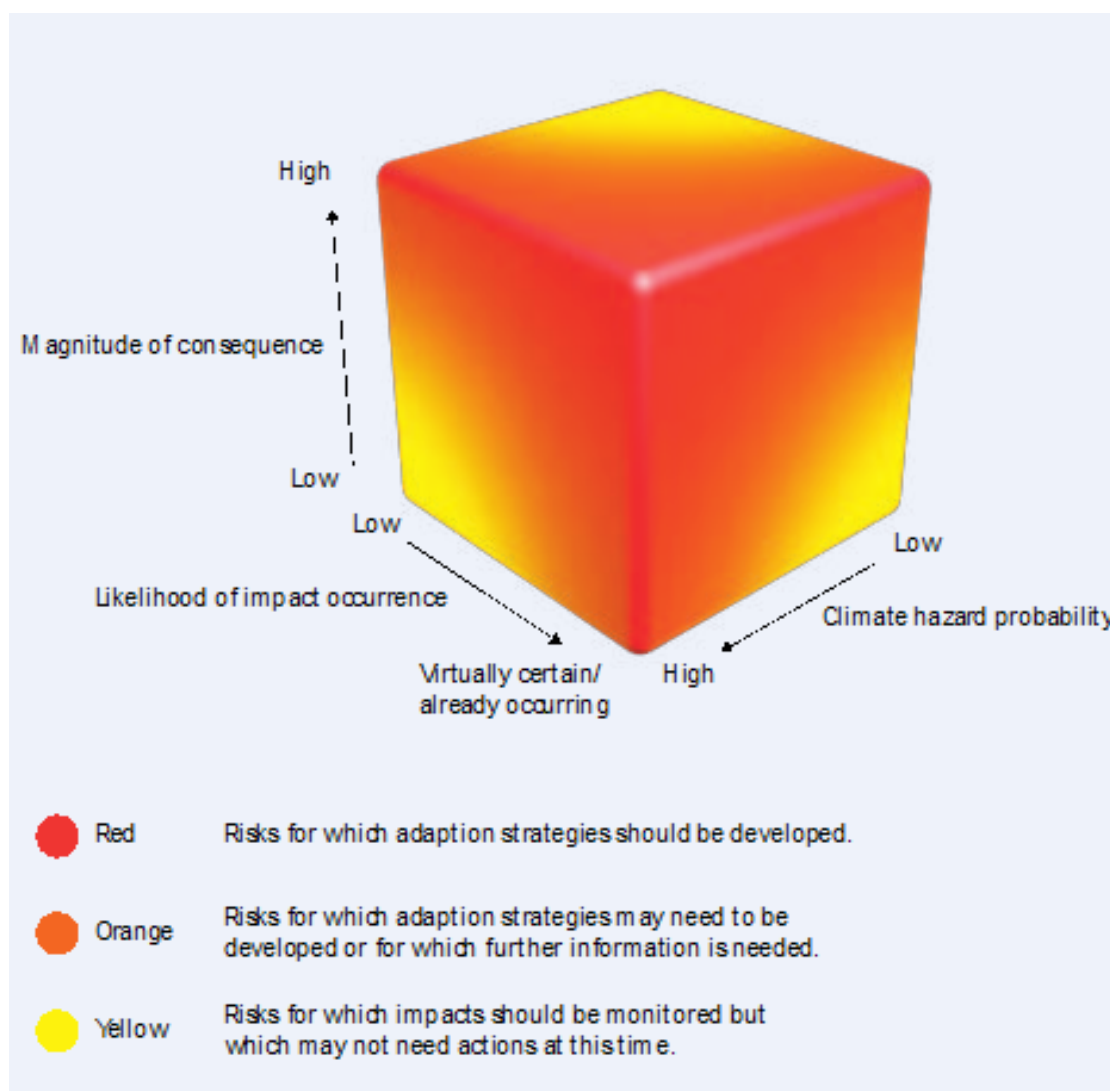
- The order of magnitude of the potential climate change impact. Some impacts can be quantified (number of people harmed, area of land affected, economic damages, etc.), while others need to be expressed in qualitative terms;
- Probability, likelihood and level of confidence. The probability of a certain climate hazard occurring or changing, the likelihood of that hazard resulting in a certain impact and the level of confidence in those estimations are very important for ranking prevailing risks;
- Reversibility. Impacts that will have irreversible consequences could be ranked higher;
- Urgency of action. Those risks that require urgent attention and action, either because they have the potential to cause immediate damage or because they will have irreversible and highly damaging consequences in the longer-term, are ranked higher;
- Other factors such as policy relevance, connectivity or cross-cutting risks across sectors or regions, and the importance of systems at risk have for national development;
- Biophysical sensitivity to the effects of climate change;
- Types of impacts, such as loss of human lives, threats to livelihoods, increases in the prevalence and severity of diseases, constraints on and shocks to economic development, increases in the magnitude and frequency of floods, droughts and other disasters, recurring or persistent famine, human displacement, and disruptions to social and political systems.

A subset of these criteria can also be used for prioritizing climate risks. For example, the matrix shown below uses three criteria, namely:

- The probability of a given climate hazard occurring. Using climate risk information as a guide, these can be defined as High or Medium or Low probability of the climate hazard occurring;
- The likelihood of impact occurrence, i.e. the likelihood that a change in a given climate hazard (e.g. temperature rise) will result in a particular impact (e.g. crop failure).
- The magnitude of the consequence. The combined impacts, should a given hazard occur, taking into account various factors such as number of people impacted, including considerations related to any impacts on vulnerable populations, economic implications and so on.

By assessing the risks on these criteria, one is able to categorise them in red, orange or yellow categories thereby prioritizing the climate risks (UNFCCC, 2012).

**Figure 27:** Presentation slide on 'Climate risk categorisation'



## PART C Climate Change Adaptation

### Responding to climate change

The United Nations Framework Convention on Climate Change (UNFCCC) identifies two responses to climate change:

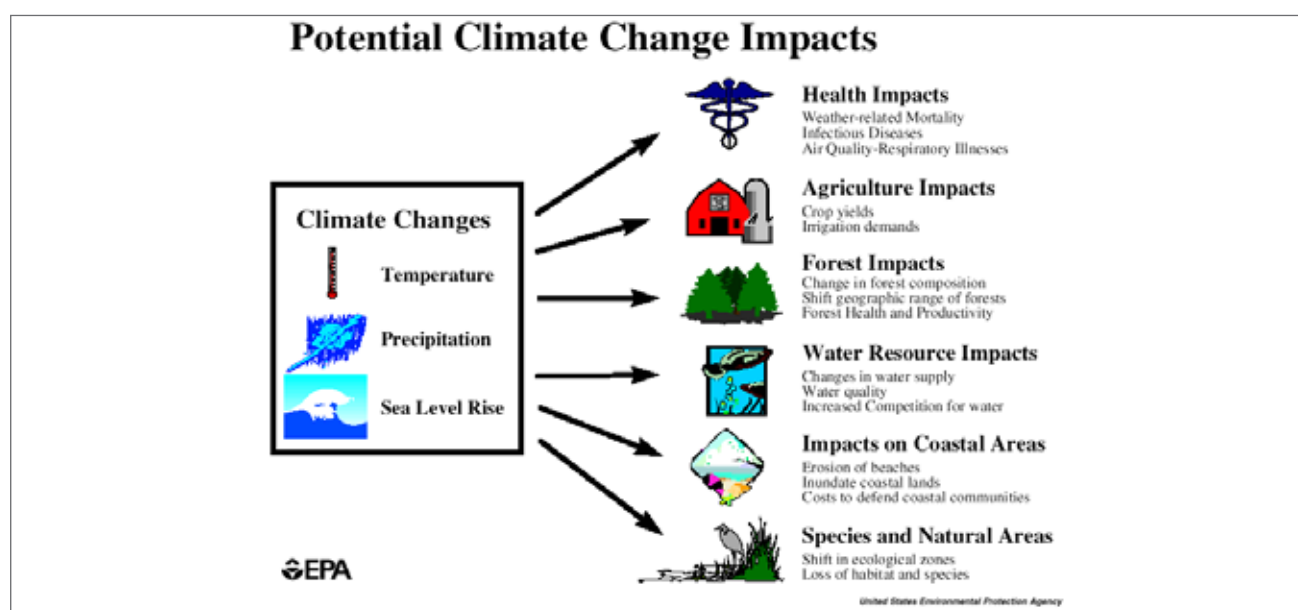
- Mitigation of climate change by reducing greenhouse-gas emissions and enhancing sinks, and
- Adaptation to the impacts of climate change.

According to the IPCC, climate change adaptation is defined as “The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.” While mitigation is “A human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs).” The IPCC Fifth Assessment Report (AR5) also “assesses human interventions to reduce the sources of other substances which may contribute directly or indirectly to limit climate change, including, for example, the reduction of particulate matter emissions that can directly alter the radiation balance (e.g., black carbon) or measures that control emissions of carbon monoxide, nitrogen oxides, Volatile Organic Compounds and other pollutants that can alter the concentration of tropospheric ozone which has an indirect effect on the climate.”

### Why climate change adaptation is needed?

Even if we take actions to mitigate GHG emissions, some degree of global warming from past emissions is already locked in. This poses a serious challenge to social and economic development, which are highlighted in the figure below by the United States Environmental Protection Agency (EPA). Global temperatures are projected to continue rising, bringing further changes in weather patterns, rising sea levels, and increased frequency and intensity of extreme weather across many regions.

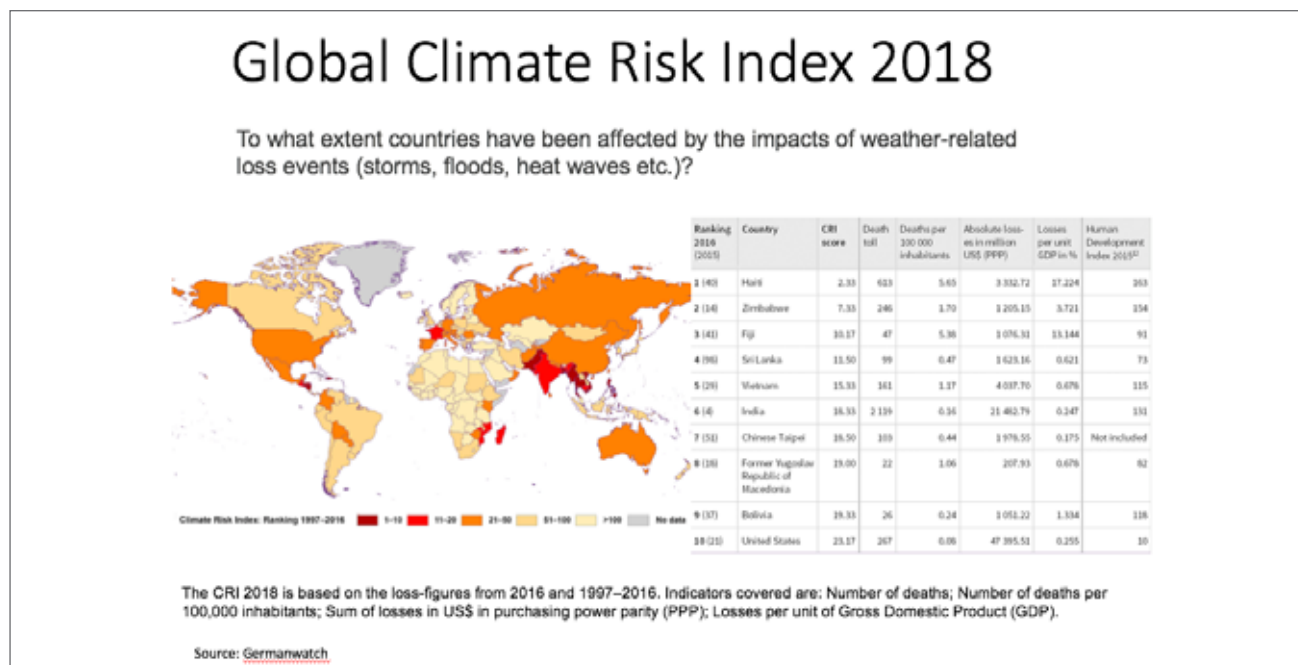
**Figure 28:** Presentation Slide on ‘Impacts of Climate Change’



India is especially vulnerable to climate change. The slide below presents the findings of the “Global Climate Risk Index” by Germanwatch, which ranks India as the 6th most vulnerable country to climate

change (Germanwatch, 2018). The index analyses the extent to which countries have been affected by the impacts of weather-related loss events (storms, floods, heat waves etc.). Refer to Annexure 11 for the latest report on this index - Global Climate Risk Index 2018.

**Figure 29:** Presentation Slide of 'Global Climate Risk Index 2018'



## PART D Climate Change Action in India

### Key developments in India on climate action

India ratified the UNFCCC in the year 1992 and since then has achieved several milestones towards addressing the issue of climate change domestically. A brief description of these key developments have been covered below. In each training, the trainer will need to synthesis this information and present it based on the expertise and interest areas of the training participants. Key resources for understanding the most up to date information on India's progress on climate policy are the latest National Communication (NATCOM) (MoEFCC, 2012) to UNFCCC, the Biennial Update Reports (BUR) (MoEFCC, 2018) to the UNFCCC, and the chapter on climate change in the Economic Surveys (Ministry of Finance, 2018) of India. Refer to Annexure 11 for the latest versions of these reports as of March 2019. The trainers are recommended to refer to these documents while preparing the content for any trainings.

India acknowledges the need for action on climate change. The country's efforts in responding to the threats posed by climate change began in June 2007 when the Prime Minister's Council on Climate Change (PMCCC) was constituted. This high level advisory group was formed with the mandate of coordinating the national action plans for assessment, adaptation and mitigation of climate change and consisted of representatives from the government, industry and civil society. The National Action Plan on Climate Change (NAPCC) was subsequently launched in June 2008, outlining measures to promote sustainable development, while also yielding co-benefits to address climate change through eight national missions. These are:

- National Solar Mission
- National Mission on Enhanced Energy Efficiency

- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Eco-system
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission on Strategic Knowledge for Climate Change

### India's NDC and SDGs

India reinforced its commitment to address climate change by submitting a voluntary pledge to the UNFCCC to reduce the country's emissions intensity of its Gross Domestic Product (GDP) by 20-25% compared to its 2005 level, by 2020.

In the last decade, there have been several plans, policies and programmes that have been introduced to support the achievement of a low carbon and climate resilient economy. All these have been covered under India's Nationally Determined Contribution (NDC) submission to UNFCCC, which are as follows:

1. To put forward and further propagate a healthy and **sustainable way of living** based on traditions and **values of conservation and moderation**.
2. To adopt a **climate friendly and a cleaner path** than the one followed hitherto by others at corresponding level of economic development.
3. To **reduce the emissions intensity of its GDP by 33 to 35 percent by 2030 from 2005 level**.
4. To achieve about **40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030** with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).
5. To **create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent** through additional forest and tree cover by **2030**.
6. To **better adapt** to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.
7. To mobilize **domestic and new & additional funds** from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.
8. To **build capacities**, create domestic framework and international architecture for quick diffusion of cutting edge climate technology in India and for joint collaborative R&D for such future technologies.

In 2015, India also adopted the Global Sustainable Development Goals (SDGs) which also call for action on climate change under SDG 13. NITI Aayog has been entrusted with the task of coordinating the SDGs and they have conducted mapping of the relevant schemes and ministries at the central level. The states have been asked to carry out similar mapping of their schemes, including centrally sponsored schemes. More details on this process and progress made towards achievement of the SDGs in India and its states can be found on NITI Aayog's website (Niti Aayog, 2016).

## PART E Gender and Climate Change

### Understanding Gender related impacts of and Climate Change

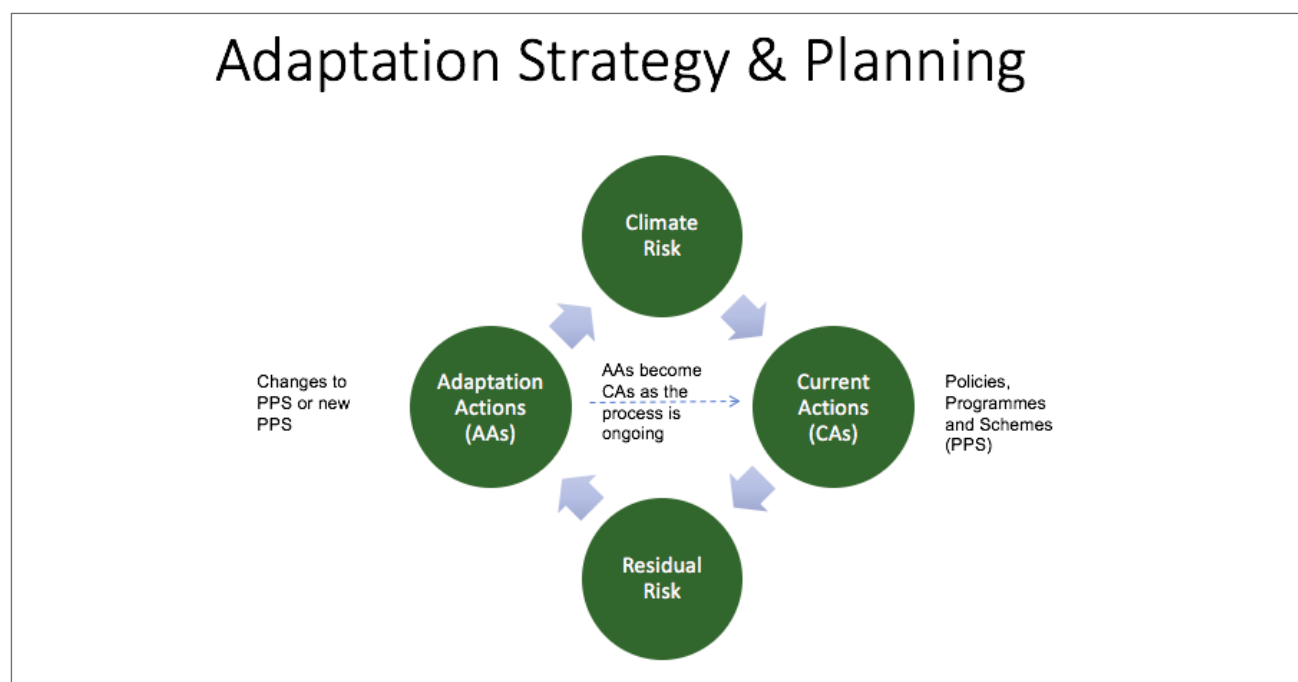
Several studies across the globe point to the fact that women face more acute and differential adverse impacts due to burgeoning challenges of climate change, environmental degradation, distress migration and natural calamities, further widening the existing gender gaps in the society. In the Indian context, the special emphasis on eradicating gender disparity becomes more pronounced as the 2018 HDR Update by UNDP ranked India at the rank of 130 (among 189 countries) with respect to the gender inequality index (UNDP, 2018). Thus, making it imperative to incorporate gender concerns into development planning and implementation at all levels of governance.

## PART F Climate Change Adaptation Strategy

### Assessment of Adaptation Gaps and Selection of Actions for Implementation

A listing of the key government Policies, Programmes and Schemes (PPS) which contribute towards CCA should be made. Examples of how a policy, programme or scheme leads to building of climate resilience should be explained. The trainers should explain the process of climate adaptation planning which requires analysis of the PPS, forming the portfolio of “Current Actions”, in order to identify gaps or “residual climate risks” (refer to the figure below). The residual risks can then be addressed through multiple adaptation actions which should be prioritized for implementation. Monitoring and evaluation of the implemented adaptation actions and generating additional information on climate vulnerabilities and risks is essential to feed back into the planning cycle.

**Figure 30:** Presentation slide on ‘Adaptation strategy & planning’

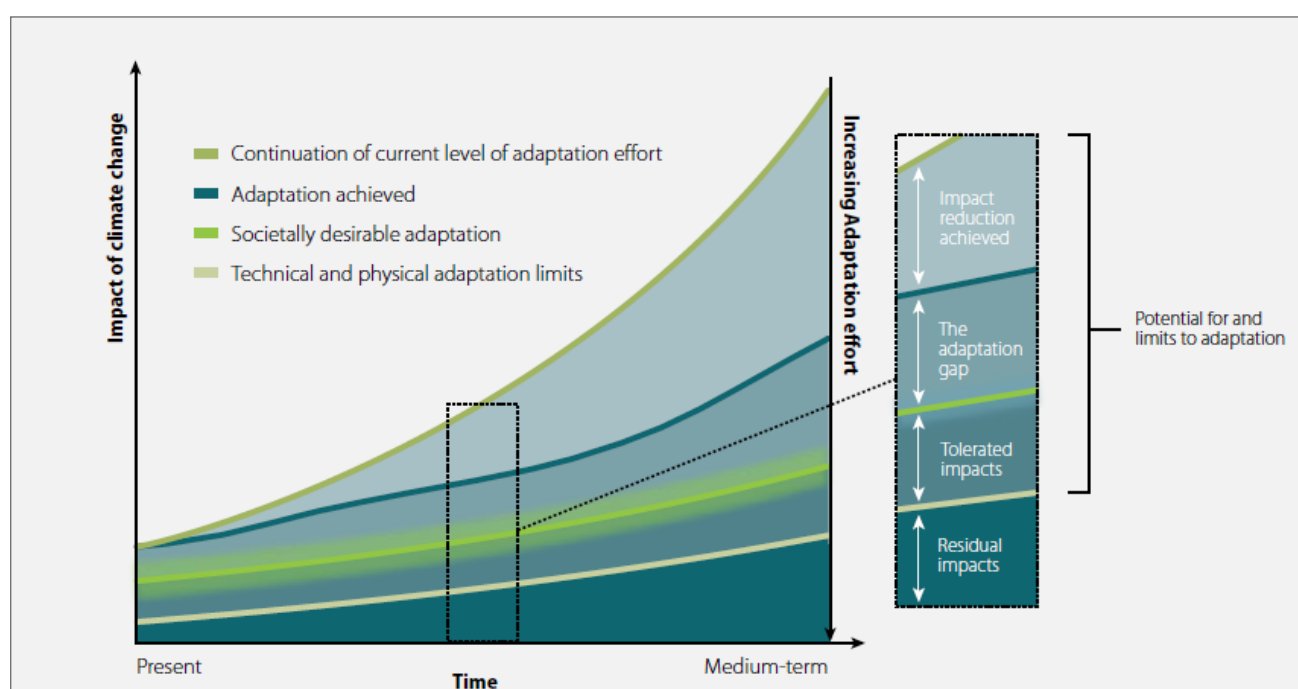


Many jurisdictions and communities are not adequately adapted to existing climate risks, thereby implying a current “Adaptation Gap”. Figure 31 from UNEP’s The Adaptation Gap Report 2014 report defines this current adaptation gap as the “difference between the actual adaptation achieved and a societally desirable level of adaptation”. On the other hand, the IPCC defines the adaptation deficit as “The gap

between the current state of a system and a state that minimizes adverse impacts from existing climate conditions and variability”, which would imply that the gap is measured against the technical and physical limits to adaptation.

The figure below summarizes the main ideas related to an adaptation gap, its development through time, and the establishment of adaptation targets. It represents a timeframe from the present to about mid-century and assumes that the world follows the Paris Agreement goal of limiting temperature rise to below 2°C above pre-industrial levels. As the UNEP report explains, the vertical axis on the left hand side of the figure indicate the climate impacts, i.e. the ‘realized climate risks’. These are expected to increase over time, but they can be reduced by increased levels of adaptation efforts, as indicated by the downward pointing arrow on the right hand side of the figure. There are, however, physical and technical limits to how much additional adaptation efforts can reduce climate impacts, for example from damage from extreme floods. These limits are represented by the bottom line ‘Technical and physical adaptation limits’, with the area below this line representing residual impacts. Technological advances may lower these impacts but cannot eliminate them, and in many cases they are likely to increase with further climate change. The line ‘Societally desirable adaptation’, aims to best represents an ‘adaptation target’. The actual level of adaptation achieved will usually be less than the societally desirable level as indicated by the lines in figure below. This arises due to various constraints such as market failures and resource inadequacy amongst others. The difference between the societally desirable level of adaptation and that actually implemented represents the “Adaptation Gap”. The upper line in the figure represents a Business-As-Usual (BAU) situation where current levels of adaptation effort are continued. If additional adaptation is not undertaken, the adaptation gap can be represented by the difference between the BAU and the societally desirable adaptation effort. The difference between the BAU and the technical and physical limits to adaptation, indicate the potential and limits for additional adaptation - compared to continuation of current levels - to reduce climate change risks and impacts. Please refer to the UNEP the Adaptation Gap Report (UNEP, 2014) for additional details on the same (Annexure 10).

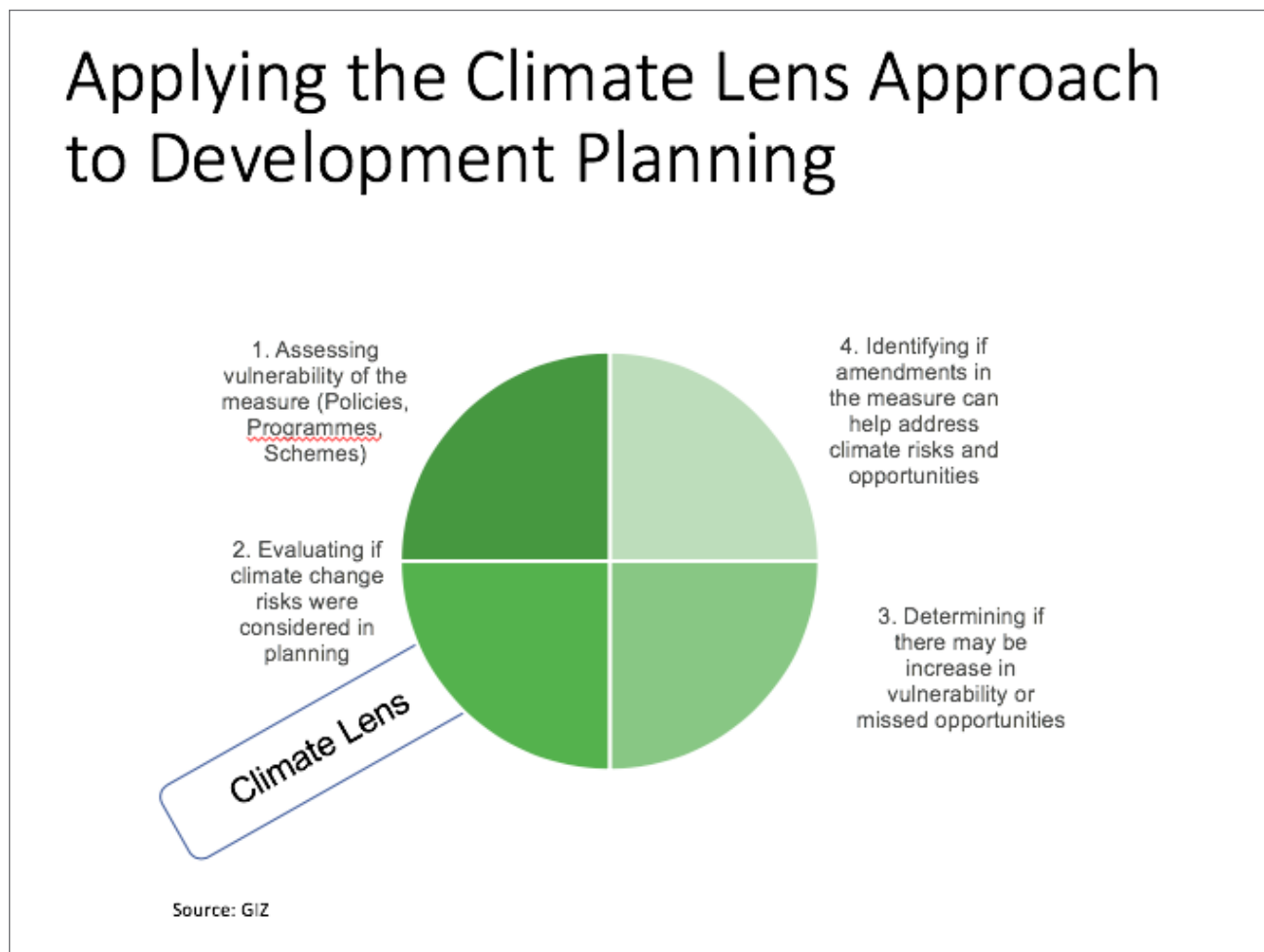
**Figure 31:** Presentation Slide on ‘Adaptation gap’



## PART G Climate Lens Approach

GIZ's climate lens approach allows one to systematically identify how to address climate change risks in relation to a PPS. The objective of applying a climate lens is to help the PPS become more resilient to climate change or more supportive of adaptation by understanding the relevant climate change risks and opportunities. The following figure illustrates the steps to be followed in carrying out this assessment.

**Figure 32:** Presentation slide on 'Applying climate lens to development planning'



The following table can be used by the trainer to take forward the work resulting from the group exercise under the previous module on 'Climate Vulnerability & Risk'. The participants in their groups can work towards understanding the existing gaps or residual climate risks and identify new adaptation strategies required to fill those gaps. An example of applying the climate lens approach to a PPS, i.e. the Rashtriya Krishi Vikas Yojana, is presented in below.

**Table 16:** Format for applying the climate lens approach to a PPS

Climate variability and risks	Bio-physical impacts	Socio-economic impacts	Existing adaptive capacities (PPS) to deal with climatic stresses	Existing maladaptation/ Residual risks	Suggested Adaptation Strategies for the PPS
<b>Extreme precipitation event</b>	Crop Damage	Impact on livelihood and food security	Rastriya Krishi Vikas Yojana	Long Term Sustainability Not Considered, Climate trends or projection analysis not incorporated	Climate Smart Agriculture
<b>Glacial Lake outburst</b>					

**Figure 33:** Presentation slide on 'RKVY Case Study'

## Case Study – Rashtriya Krishi Vikas Yojana

- Enables preparation District Agriculture Plan to achieve the targeted growth rate of agriculture in a district
  - Example – A district in Karnataka
- Target: to achieve the targeted growth rate of 4.5% productivity in agriculture and allied sectors on a sustainable basis and increase rural employment and income to raise the levels of living standards of the targeted section of the society.
- The Plan:
 

The district is predominantly agrarian which needs additional financial assistance for agriculture growth.

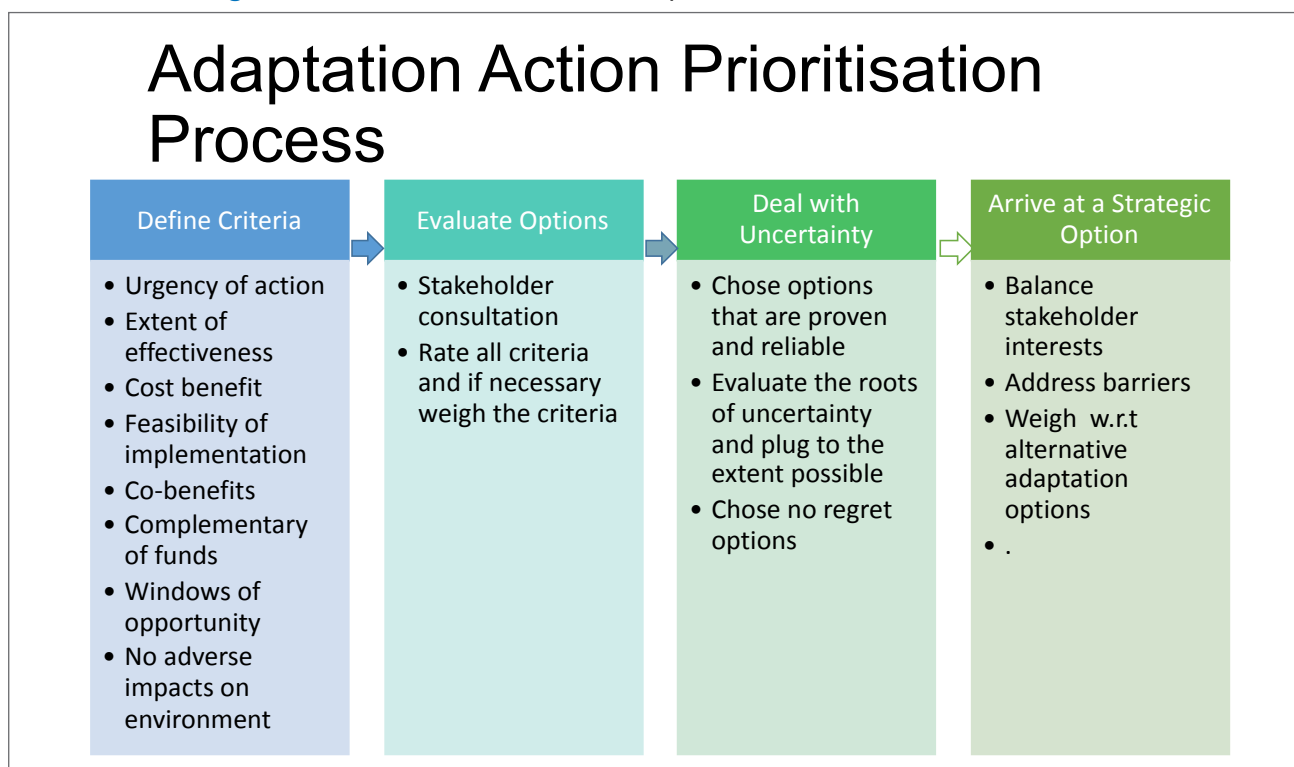
  - 42 innovative schemes,
  - agriculture sector ( 64.5 crores),
  - irrigation (45 crores)
  - animal husbandry (40 crores)
  - horticulture ( 35.45 crores).
  - fisheries, sericulture, marketing, social forestry and industrial development have been allotted with 7.45, 9.75, 30.8, 5.0 and 4.55 crores respectively

**Figure 34:** Presentation slide on 'Applying climate lens on RKVY'

Applying the climate lens on RKVY			
Climate Risk	Risks Considered (Y/N)?	To what extent the vulnerabilities are likely to increase	Measures to be considered
<ul style="list-style-type: none"> <li>• 70% rainfed</li> <li>• Cash crop is predominant</li> <li>• Drought frequency is increasing</li> <li>• Rainfall is becoming sporadic and when it happens it is extreme in nature</li> <li>• Soil erosion is high</li> <li>• Soil has deficient nutrient status</li> </ul>	<ul style="list-style-type: none"> <li>• No analysis of climate trends and climate projections</li> <li>• Long term sustainability of production of the land not considered</li> </ul>	<ul style="list-style-type: none"> <li>• Temperature by 2050 is likely to rise by 1.5°C</li> <li>• Increase in intensity of extreme precipitation likely to increase</li> <li>• Number of drought days projected to increase beyond normal 4 days</li> </ul>	<ul style="list-style-type: none"> <li>• Climate smart agriculture</li> </ul>

As there maybe multiple adaptation strategies/actions that are identified, the figure below outlines the process that can be followed for prioritizing the adaptation actions to be implemented.

**Figure 35:** Presentation slide on 'Adaptation Action Prioritization Process'

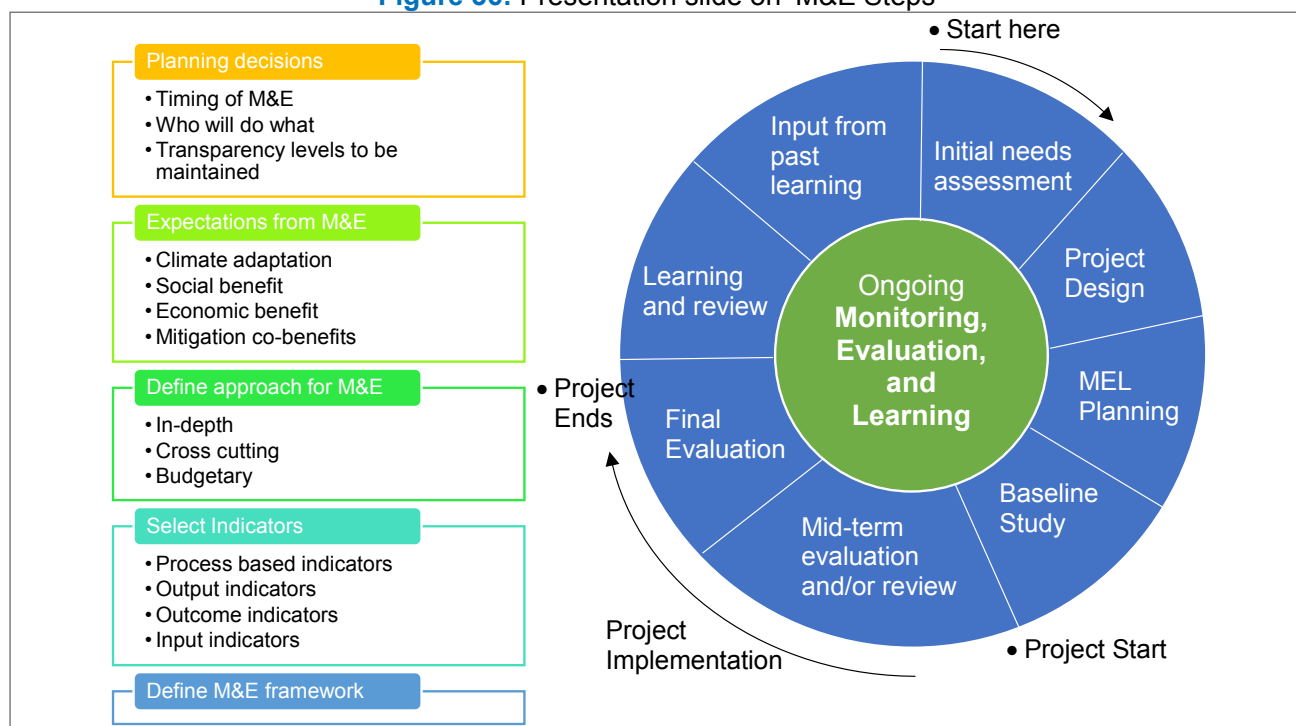


## PART H Monitoring and Evaluation

### Monitoring & Evaluation of Climate Adaptation Actions

There are several methods of doing M&E for adaptation and it also depends on the level at which M&E is being carried out as shown in the slides below. Figure 29 details the steps involved in developing an M&E system throughout the lifecycle of a particular project. Figure 30 gives examples of M&E indicators that can be selected for a particular project. The trainers can refer to GIZ Adaptation M&E Trainer's handbook and manual linked in Annexure 11 (GIZ, 2013).

**Figure 36:** Presentation slide on 'M&E Steps'



**Figure 37:** Presentation slide on 'M&E Indicators'

Examples of M&E Indicators			
Process Based Indicators	Input based indicators	Output based indicators	Outcome based indicators
<ul style="list-style-type: none"> <li>• Indicator 1: The process has been launched</li> <li>• Indicator 2: A full assessment of risks relating to CC available</li> <li>• An overall action plan has been set up</li> <li>• The plan has been implemented and M&amp;E methods defined</li> </ul>	<ul style="list-style-type: none"> <li>• Cost effectiveness of interventions within an adaptation action</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture: Increase in number of farmers doing integrated farming</li> <li>• Forests: increase in forest canopy and increase in rejuvenated areas</li> <li>• Tourism: Hotel Building adopted to summers</li> <li>• Water: Increase in water harvesting structures, increase in artificial ground water recharge sites</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in food insecurity</li> <li>• Reduction in agriculture water stress</li> <li>• Increase in productivity</li> <li>• Increase in biodiversity</li> </ul>

## PART I Climate Finance

### Climate finance for addressing climate change

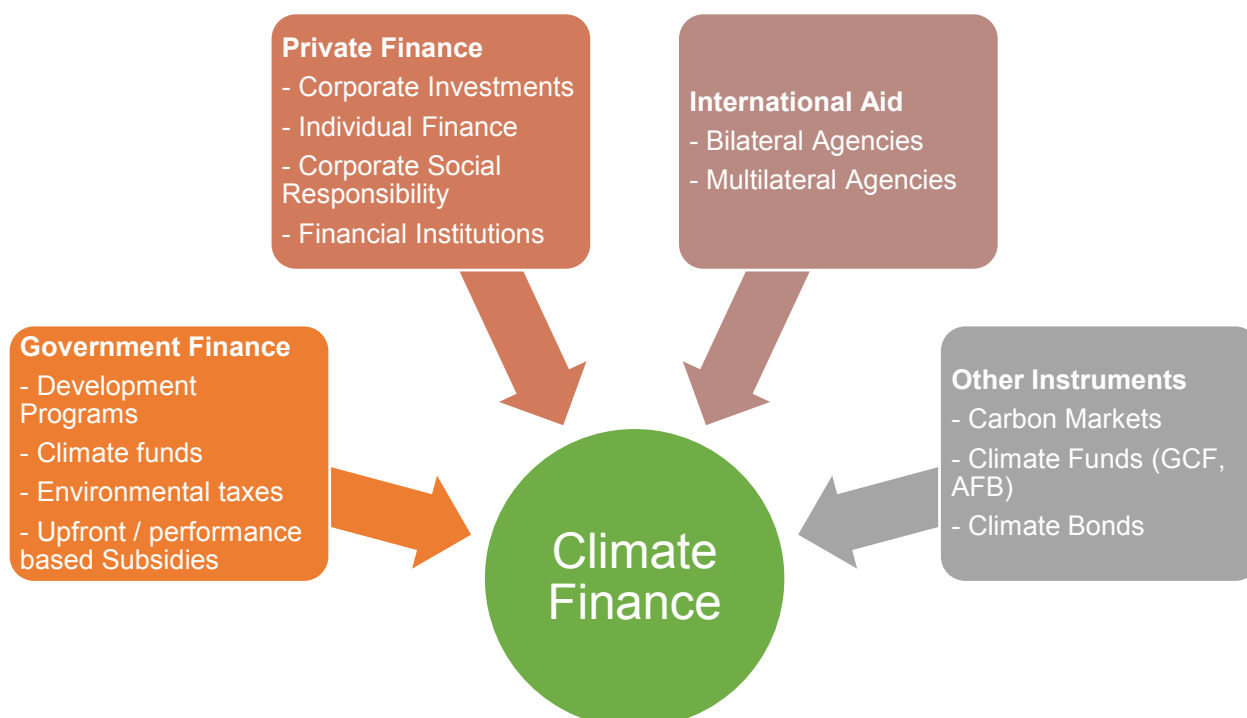
Climate finance refers to local, national or transnational financing - drawn from public, private and alternative sources of financing - that seeks to support mitigation and adaptation actions to address climate change.

**Figure 38:** Steps for determining finance requirement



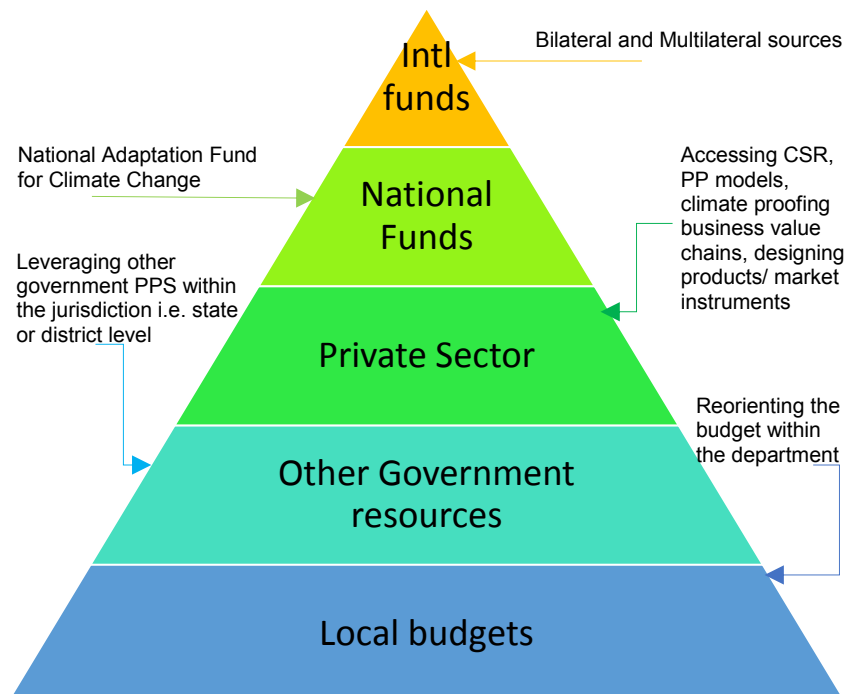
There are various public and private sources of finance available for supporting climate adaptation actions at the State level which are highlighted in the figure below. Please refer to the presentation deck provided along with this guidebook for examples and case studies on each of the sources mentioned in the figure.

**Figure 39:** Presentation slide on 'Sources of finance'



The various sources of climate finance that can be accessed fall within a 'Climate Finance Hierarchy' (refer to the figure below).

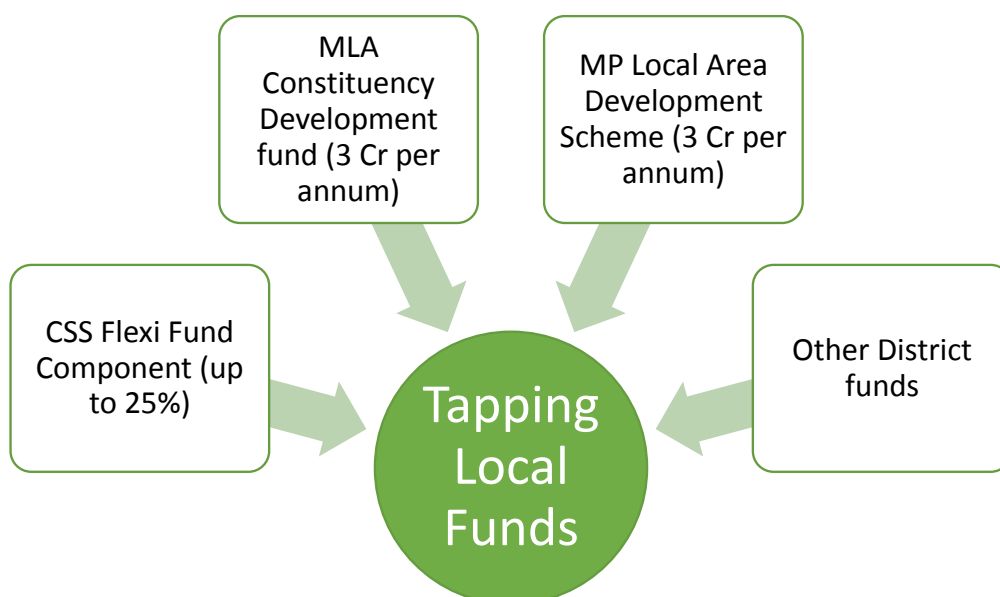
**Figure 40:** Presentation slide on 'Climate finance hierarchy'



With a state, the local administrations can follow the Climate Finance Hierarchy (starting from below) by beginning to reorient its own local budgets to increase financing towards adaptation actions and move towards accessing other external funding sources available at national and international level (top of the pyramid).

Further, at the district level, the administration can tap into funds that are exclusively available at the local level which are shown in the figure below.

**Figure 41:** Presentation slide on 'Funds available at local level'

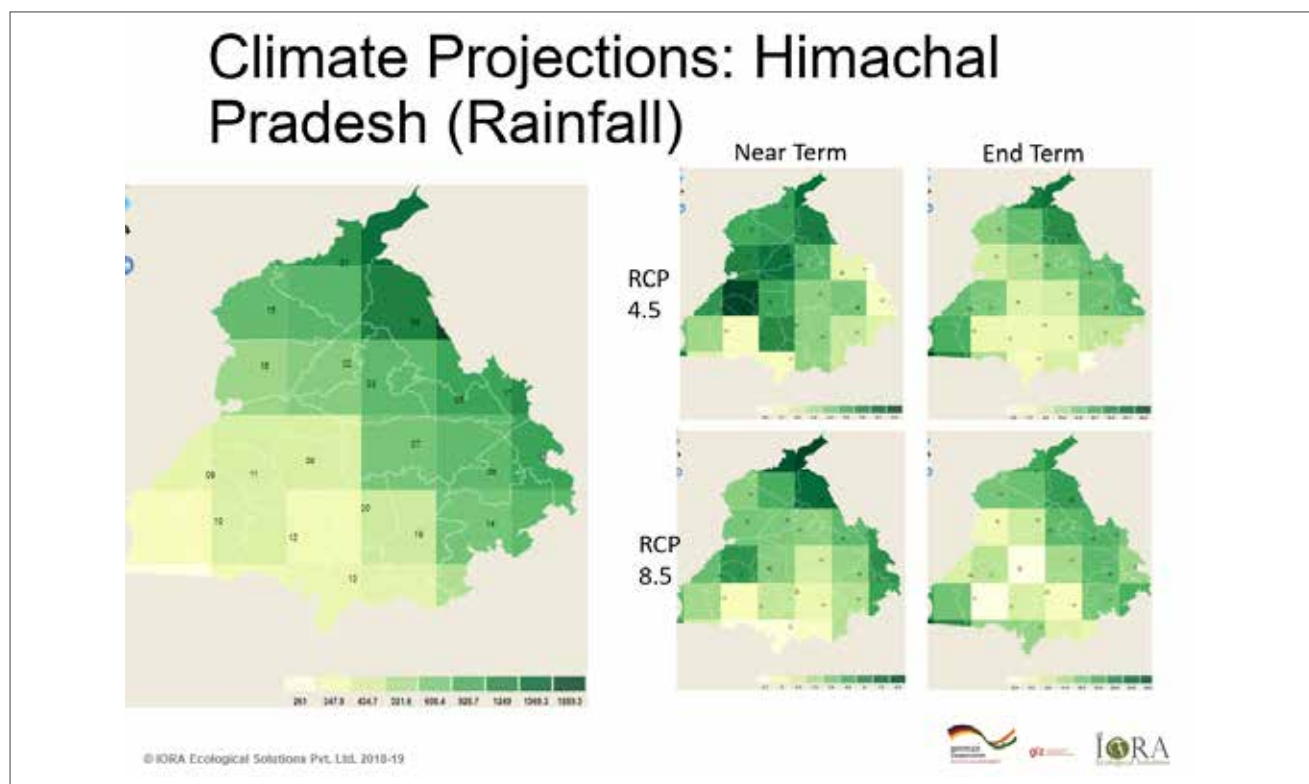


## PART J Sample Presentation Slides

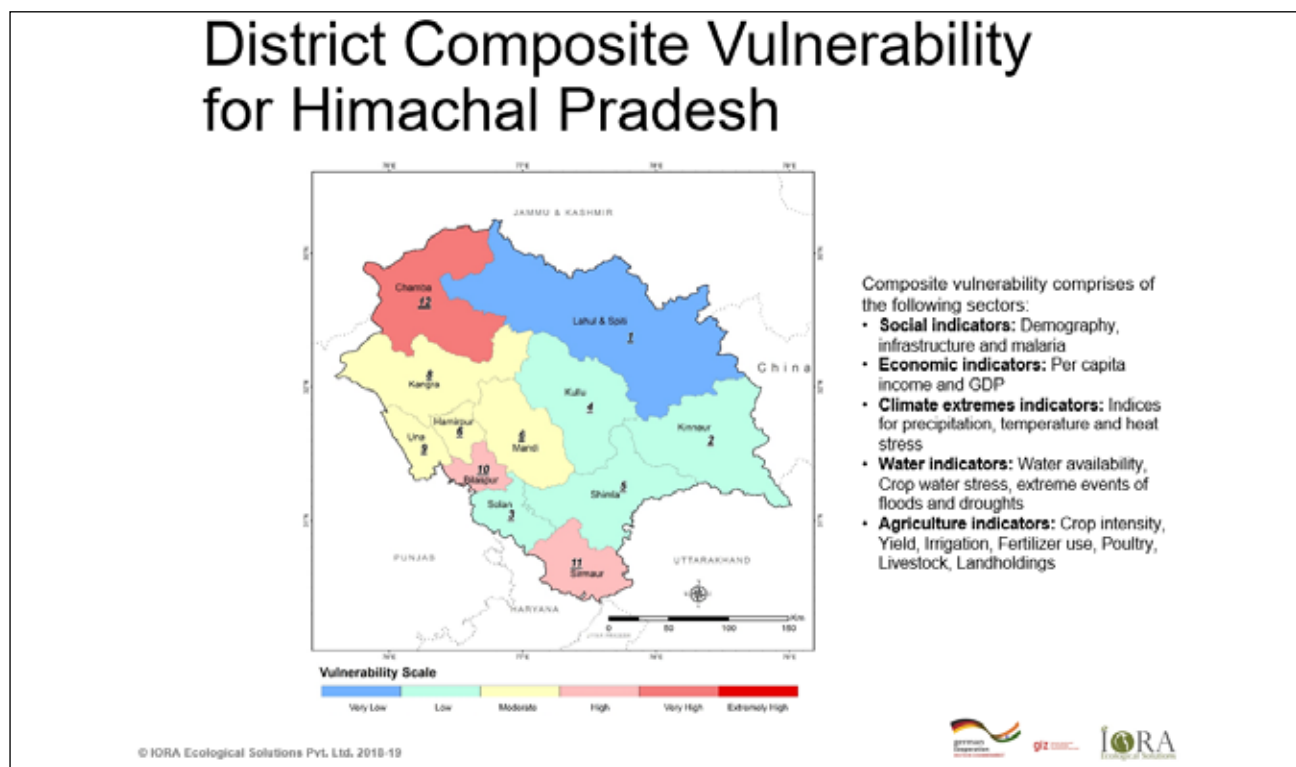
**Figure 42:** Presentation Slide on 'Drought, Water Crisis in Himachal Pradesh'



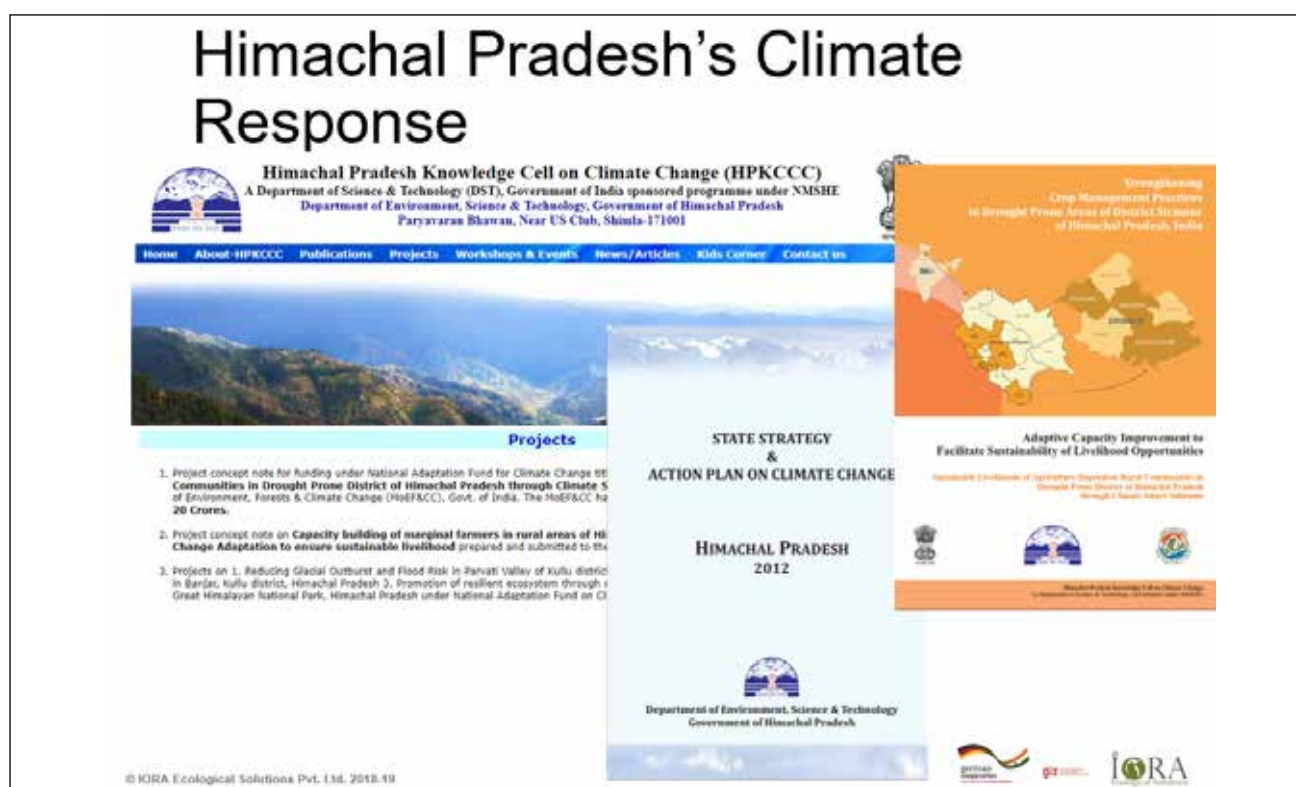
**Figure 43:** Presentation Slide on 'Rainfall Projections for Himachal Pradesh'



**Figure 44:** Presentation Slide on District Composite Vulnerability in Himachal Pradesh'



**Figure 45:** Presentation Slide on Himachal Pradesh's Climate Response



## Annexure 6: Suggested questions for Panellists participating in Panel discussions

### Climate change expert:

Will give an overview of the changes observed and projected climate change in the state with specific information on the following that are related to natural resource planning:

- Average, min, max Temperature trends and projections (spatial spread- annual, seasonal, extreme temperature and their likely durations)
- Duration and frequency of hydro-meteorological droughts
- Precipitation (spatial spread – annual, seasonal, extreme precipitation, likely duration, return periods of extreme precipitation events)
- Climate change impact on onset of south west and north east monsoon
- Evapotranspiration rates (current and future)
- Soil moisture (current and future)
- Any other relevant question

### Water Resource Expert:

- What is the district wise fresh water availability- ground and surface water availability in Himachal Pradesh?
- What are the district wise impacts of projected climate change on water availability in the future 2050s and 2100 for different uses (Blue, green, and grey water).
- How much is the capacity of sea water purification presently if applicable for the State? Can it emerge as a major source of drinking water for the State? What kind of capacity addition has to be done to do so?
- What is the recyclable capacity required presently to recycle and reuse industrial waste water and domestic waste water for all purposes other than drinking and putting it for agriculture use?
- Any other relevant question

### Agriculture Expert

- What is the percentage of population dependent on agriculture exclusively for livelihoods?
- What are the key crops grown (agriculture crops and horticulture) season wise in different districts?
- What is the impact of climate change on these crops in these districts?
- What is the livestock mix in these coastal districts? What is the mix of cattle - crossbred vs. indigenous and buffalo? What is the milk generating capacity currently by type? What are the impacts on cattle by type and on buffalo due to climate change (heat stress+ other impacts)? Can

we replace cross bred by indigenous completely? If so what will be the impact on milk generation capacity? Is there an economic assessment of the likely impacts?

- Any other relevant question

### **Forestry and Biodiversity**

- List the key coastal ecosystem and biodiversity.
- What are the key infrastructure including energy infrastructure that are at risk in the State? – may be depicted on a map?
- What will be the impact of climate change (rise in temperature, sea level rise etc.) on infrastructure
- An economic assessment of impact of climate change on infrastructure
- Any other Relevant question

### **About SAPCC**

- Genesis of SAPCC,
- Methodology of preparation of SAPCC,
- Missions/Sectors covered.
- Strategies suggested by sector focusing
- Institutional arrangement proposed for implementation of this activity- the departments identified and how they are related to overall SAPCC institutional arrangements (create a diagram)
- Any other relevant question

## Annexure 7: Suggested design of the field visit and information to be provided to participants

1. The field visit will be at \_\_\_\_\_, Starting time \_\_\_\_\_, Pick up points for participants \_\_\_\_\_ and other logistics to be announced the previous day
2. **The programme of the field visit will be as follows:**
  - Pick up as per previous day discussions with Participants
  - Travel to Field site
  - Transact walk and mapping of village farms, village infrastructure and other assets
  - Discussions with locals
  - Observations to be noted all through
3. **Key issues to be discussed with the locals in the field visit**
  - Key climate change risks in the village (short and long term)
  - What are the possible associated vulnerabilities – are they matching with what had been discussed in sessions 4?
  - Check the Government programmes being accessed and if they are addressing the identified risks and associated vulnerabilities – are they matching with the adaptation strategies identified in session 5?
  - Aspects of the climate change challenges not being addressed by any one of the programmes
  - What should then be a scheme that could be added to ameliorate vulnerabilities and risks of Climate change within an existing programmes/s or a new scheme
4. **Key issues to be observed at institution working on climate change observation**
  - Description of the adaptation actions being used (technology, policy, insurance, community actions etc.)
  - Implementation arrangement if it is a project and or how the extension is reaching out to the target area
  - Monitoring and evaluation framework being used to ascertain climate change adaptation
  - Financing (extent of financing required and source of financing)
  - Any other
5. **Back to city by 1730**

## Annexure 8: Sample Registration Form and attendance sheet

### Sample registration/attendance form

Sr no.	Name of Participant	Designation	Organisation	Mobile no.	Email ID	Signature

## Annexure 9: Sample Feed Back Forms

### Feedback form: Capacity Building training on 'Integrating Climate Change Adaptation in Development'

Name of the Participant (Optional):

Indicate below, on which days you attended this training (check all that apply)

Day 1 \_\_\_\_\_ Day 2 \_\_\_\_\_ Day 3 \_\_\_\_\_

For each item below, please circle only a single appropriate response.

		RESPONSE		
		NOT AT ALL	SOMEWHAT	VERY MUCH
1.	The training was well organized.	0	1	2
2.	The training sessions were relevant to my needs.	0	1	2
3.	The presenters were well prepared.	0	1	2
4.	The presenters were receptive to participant comments and questions.	0	1	2
5.	The exercises helped me to learn the material.	0	1	2
6.	There was enough time to cover all materials.	0	1	2
7.	I expect to use the knowledge and skills gained from this training.	0	1	2
8.	The training facilities were adequate.	0	1	2

### Feed Back Form: Self-Assessment of Learning

Think about what you already knew and what you learned during this training about climate change. Then evaluate your knowledge in each of the following topic areas **Before** and **After** this training.

1 = No knowledge or skills      2 = Some knowledge or skills      3 = A lot of knowledge or skills

BEFORE TRAINING			SELF- ASSESSMENT OF YOUR KNOWLEDGE AND SKILLS RELATED TO: [List objectives covered in training]	AFTER TRAINING		
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3
1	2	3		1	2	3

**Please reflect on the training that you just completed and respond to the following:**

1. What part of the training was the **most useful** for your work?
  
  
  
  
  
  
  
  
  
  
2. What part of the training was the **least useful** for your work?
  
  
  
  
  
  
  
  
  
  
3. Suggestions for information/topics to be added to this training, if any?
  
  
  
  
  
  
  
  
  
  
4. Suggestions for improvement of course, if any

***Thank you for completing this form!***

## Annexure 10: Reading List

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