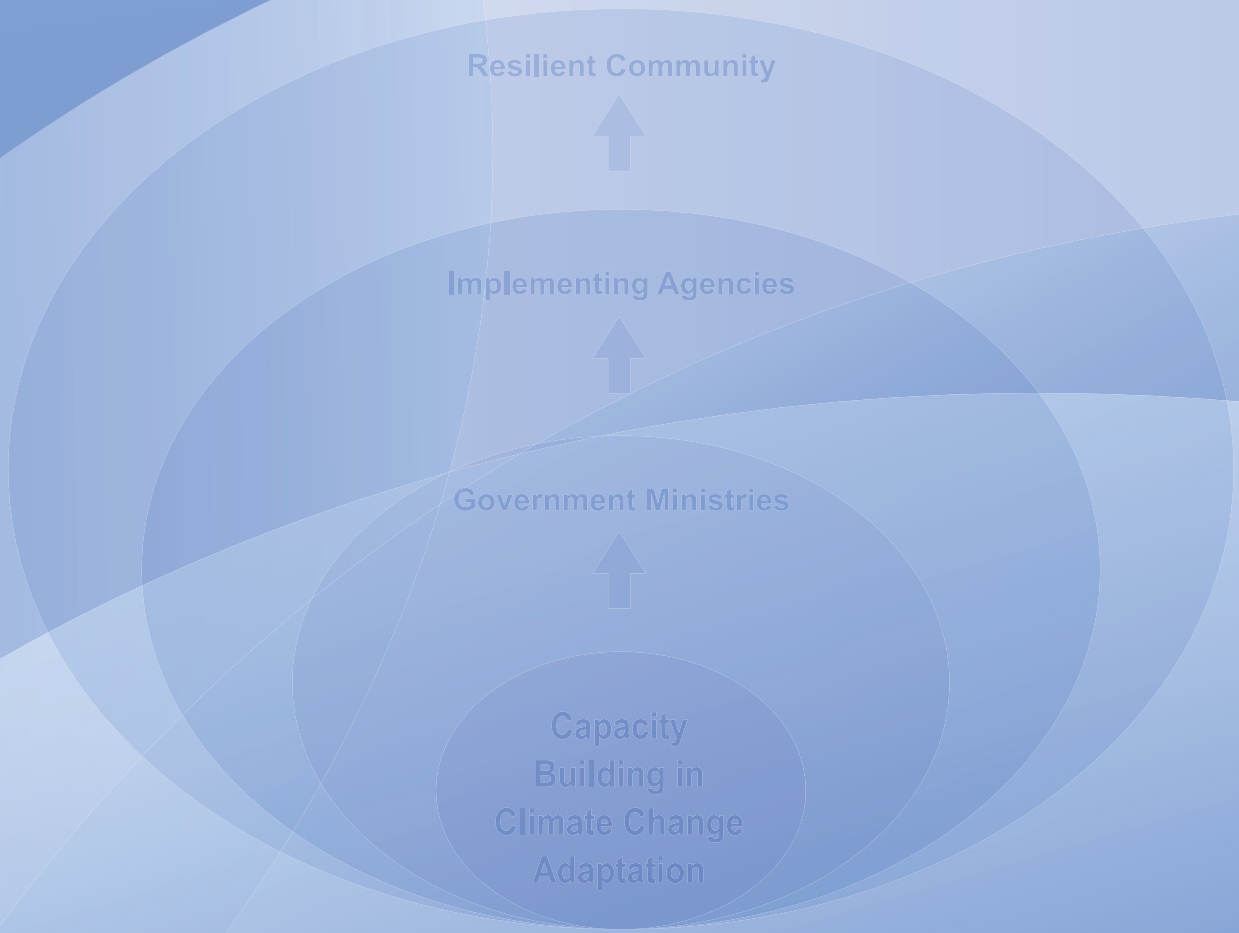
CLIMATE CHANGE ADAPTATION

A Trainer's Handbook



Comprehensive Disaster Management Programme (CDMP II)
Ministry of Disaster Management and Relief

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Message

We all know that geo-physical position of Bangladesh makes it highly vulnerable to natural disasters. Due to the trend of global climate change, the country is becoming more susceptible to extreme climactic events that induce rapid and slow on-set hazards and disasters. Bangladesh frequently experiences climate induced natural hazards including floods, cyclones, droughts, salinity, water-logging, river and coastal erosion, hailstorms, tornados, tidal surge and landslides etc. Impact of climate change is increasing the threat of natural disaster and affecting the lives and livelihood of millions.

In this scenario, the underpinning need for improving capacity at all levels stands critical and a comprehensive capacity building process including development of training manual and modules are necessary. I am very happy that the Comprehensive Disaster Management Programme (CDMP II), Ministry of Disaster Management and Relief (MoDMR) has taken initiative and prepared a training manual on 'Climate Change Adaptation: A Trainer's Handbook' for the ministries and executive agencies. The aim is to improve the knowledge and skill of the officers and staff of the ministries, executive departments, agencies, institutions so that they are able to interpret the consequences of climate change and can plan and device interventions to address the change and impacts.

I am confident that the 'Climate Change Adaptation: A Trainer's Handbook' will serve as a ready resource for experts, professionals and officers to provide training to the stakeholders. I wish all concerned a creative application of the modules and contents to improve the knowledge and skills of the users and thus improve the capacity of the people at risk.

I express my heartfelt thanks to UNDP and other development partners for supporting CDMP II, MoDMR to prepare, print and publish the training manual for greater audience.

Mesbah ul Alam

National Project Director
(Additional Secretary)
Comprehensive Disaster Management Programme (CDMP II)

Foreword

Bangladesh is one of the most vulnerable countries to natural hazards due to its geographic location and geo-physical condition and will become even more so as a result of climate change. Floods, tropical cyclones, storm surges, tidal surge, saline water intrusion, droughts, etc are likely to become more frequent and severe in the coming years. Combined with the country's geographical location, topography and dense population with persistent poverty, the natural hazard events often result in high loss of lives and economic damage while climate change is exaggerating the situation and imposing future threats. These changes will threaten significant achievements Bangladesh has made over the last 20 years in increasing incomes and reducing poverty and will make it more difficult to achieve the MDGs.

Comprehensive Disaster Management Programme (CDMP II) is a project of Government of Bangladesh (GoB) with support from UNDP and a host of development partners. Ministry of Disaster Management and Relief (MoDMR) is the host ministry and provides overall guidance on behalf of GoB. The goal of CDMP II is to reduce the country's vulnerability to adverse natural and anthropogenic events - including floods, cyclones, tidal surges, earthquakes, tsunamis, climate change and variability, fires, building collapses etc through technical assistance in risk reduction and adaptation activities.

The capacity building strategies of CDMP II is focused on providing training to the officers and the professionals of the host and partner ministries, their executive agencies, other institutions and organizations. The aim of the capacity building effort is to improve their knowledge and skills in a way that they are able to apply updated information, tools, techniques and methods in adaptation and risk reduction policies, strategies and measures. CDMP II also provides training to the academic, research and other institutions, NGOs to develop their capacities to design and implement a variety of projects for scaling-up of adaptation and risk reduction activities.

The manual on 'Climate Change Adaptation : A Trainer's Handbook' is first such kind of training manual in Bangladesh which could be used for providing need based training to the government officers and other stakeholders at various levels. I hope the training manual will serve as a resource for imparting training and thus to address the risks and vulnerabilities associated with disaster and climate change.

I encourage relevant officers, development professionals and all concerned to make use of the training manual and take pro-active efforts so that the benefits of training reach to the end users and vulnerable communities. I congratulate and convey my sincere thanks to the manual preparation team for the hard work and fellow colleagues for thorough editing and publishing the document.

Mohammad Abdul Qayyum

Acknowledgement

Comprehensive Disaster Management Programme (CDMP II) aims to mainstream disaster risk reduction (DRR) and climate change adaptation (CCA) in to the development planning of respective partner agencies. As part of the mainstreaming process CDMP II provides regular training to the officers and the professionals of the partner ministries, their executive agencies, other institutes and organizations. Major objectives of the training efforts are to improve their knowledge and skills in a way that they are able to apply updated information, tools, techniques and methods in adaptation and risk reduction policies, strategies and measures. It will enable them interpreting climate change scenarios (rain, flood, drought, salinity, erosion, temperatures) and to screen and endorse adaptation plan. The need for comprehensive training manual on climate change adaptation has been long pending. The comprehensive training manual called 'Climate Change Adaptation: A Trainer's Handbook' prepared by CDMP II is first of its kind in Bangladesh. The manual contains 12 modules that provide details of basics of climate change, impacts, vulnerability, adaptation, mainstreaming climate change, climate resilient development, gender and climate change etc.

Preparation of the manual involves contribution of many people including CDMP experts, officers of Department of Disaster Management (DDM) and Ministry of Disaster Management and Relief (MoDMR) and professionals from other national institutions and agencies. It went through a rigorous review and improvement process and thus took an extended time to come up to the state of publication. It is not possible to acknowledge and list the names of all who provided inputs and suggestions in the preparation and development of the 'Climate Change Adaptation: A Trainer's Handbook'.

Development of concept and preparation of the first draft of the manual were immensely benefitted from a number of CDMP and UNDP professionals including Mr. Abu M Kamal Uddin, Dr. Liakath Ali, Ms. Munazza Jaleel Naqvi and Mr. Showkat Osman. Ms. Niger Dil Nahar provided inputs on the Gender aspects of climate change. Mr. Nasimul Haque, SDRC undertook a professional review and improved the manual with regard to technical contents and also presentation in a training language. The updated version was again reviewed by Dr. Mohammad Asaduzzaman, Professional Fellow, BIDS for his final comments and remarks especially on the technical aspects of climate change and the institutional arrangement. The communication team of CDMP reviewed the whole document more than once as part of communication integrity and presentation. Mr. Goran Jonsson, Senior Program Advisor, UNDP and Mr. Peter Medway, Project Manager, CDMP II provided their guidance and valuable suggestions throughout the process of the development of the manual. Mohammad Abdul Qayyum, National Project Director, CDMP II took interest to oversee the development of the manual from the beginning to end.

The manual 'Climate Change Adaptation: A Trainer's Handbook' will be distributed to various government, non-government organizations, training and academic institutions so that they can use the same for capacity building activities for their staff and counterparts. The whole effort will be a success once the manual is utilized as appropriate at various levels of the users.

We sincerely acknowledge inputs, comments and suggestions from all concerned professionals and institutions including development partners, UNDP in particular.

Sanjib Kumar Saha
Response and Adaptation Management Analyst

Mirza Shawkat Ali
Climate Change Adaptation Specialist

Contents

INTRODUCTION

The "Climate Change Adaptation : A Trainer's Handbook" aims at assisting training organizations and trainers to design training events, modules and sessions suitable to the learning needs and priorities of targeted participants.

Accelerated global warming is influencing our climate, causing changes and challenging development initiatives. The scientific communities are collaborating to understand the causes of rapid warming and its effects on nature and human society. Evidence of a warming world already is widespread. The arctic sea ice as well as ice caps on mountain ranges is melting rapidly. Sea level is rising faster, threatening coasts and low lying countries. The pattern, frequency and intensity of extreme weather events are becoming more unpredictable, uncertain and damaging. All the evidences of a warming world bear strong consequences for many generations to come in future.

Nations and governments recognize the evidence of a warming world. The global community of scientists, governments, advocates, leaders, institutions have collectively taken efforts to address issues of climate change. Scientists provide evidence of a warming world as well as scenarios of likelihood of a future based on synthesis of knowledge about trends in different elements of our natural, physical and social environment. Governments, under the United Nations, collectively take decisions on responses to climate change. The responses are articulated and governed by a Framework Convention on Climate Change (UNFCCC) and its related instruments. A key response to climate change is reducing greenhouse gas (GHG) emissions as early and as much as possible. This is because scientists have already confirmed that accelerated amounts of GHG emissions from fossil fuel during the past one and half century have increased the concentrations in the atmosphere triggering warming at unprecedented levels. However, fossil fuel is the current source of energy for majority of countries to drive its engines of growth and prosperity. Carbon dioxide is a major contributor of human induced GHG emissions. This adds dilemma to the challenge, as energy requirements for our societies need to shift from high carbon to low or carbon neutral sources.

Bangladesh has a history of climatic hazards and extreme weather events of catastrophic nature. Lives are lost, properties are destroyed, infrastructure damaged, and services disrupted due to the vulnerability of the country, its people and resources. At the same time, the country and its people are engaged in a continuous struggle for survival, and to improve their lives, and opportunities for sustained development.

Global warming induced changes in the climate are already influencing our weather patterns, as evidenced in recent decades. Floods, cyclones and drought are more evidenced in recent decades along with extreme spells of weather events (low or high temperature regimes, erratic rainfall pattern, etc.). Climate change affects natural processes and cycles which in turn have impact on lives and livelihoods of people, economy and development. The global community recognizes the country as one of the most vulnerable to adverse impacts of climate change.

Therefore it is not a choice but an imperative for everyone in the country, particularly Government Officers, to understand impacts of climate change for Bangladesh, its people, economy, development achievements, and possible risks and potential actions in translating future aspirations into reality.

The Handbook contains basic knowledge on key themes and topics selected in line with the emerging needs and challenges for development aspirations and achievements.

The Handbook is designed for use as a guide to plan and conduct learning sessions for government officers. As such, the contents are drawn from sources which are nationally and internationally recognized and accepted. The sources are described so that a search to update current knowledge is possible to the users.

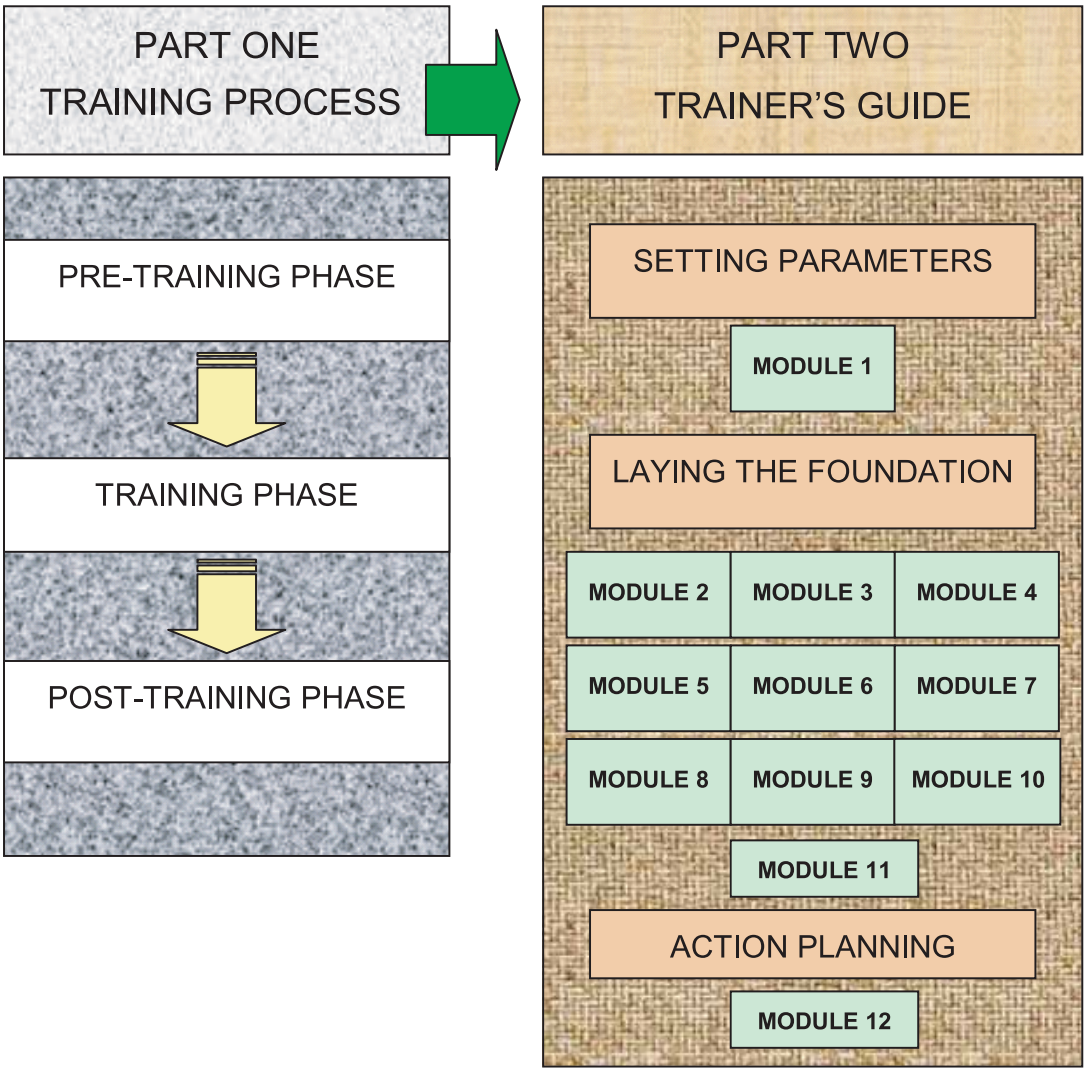
A professional trainer or a training team engaged in planning and conducting training and learning activities and processes, for government professionals serving at different levels of various fields, will find this Handbook useful as it provides systematic description of key issues and topics relevant to the participants' level of understanding as well as learning needs.

GUIDE TO THE TRAINER'S HANDBOOK

Structure

The first part of the **TRAINER'S HANDBOOK** outlines the training process, providing insight into the target audience and identifying key teaching concepts. The second part maps out the training activity, with emphasis on integral components such as the objective, coverage, methodology and participant profile. Ideally for a five-day course, the guide could easily be adapted for shorter term training sessions. It could also serve as an orientation material.

Structure of the Trainer's Handbook



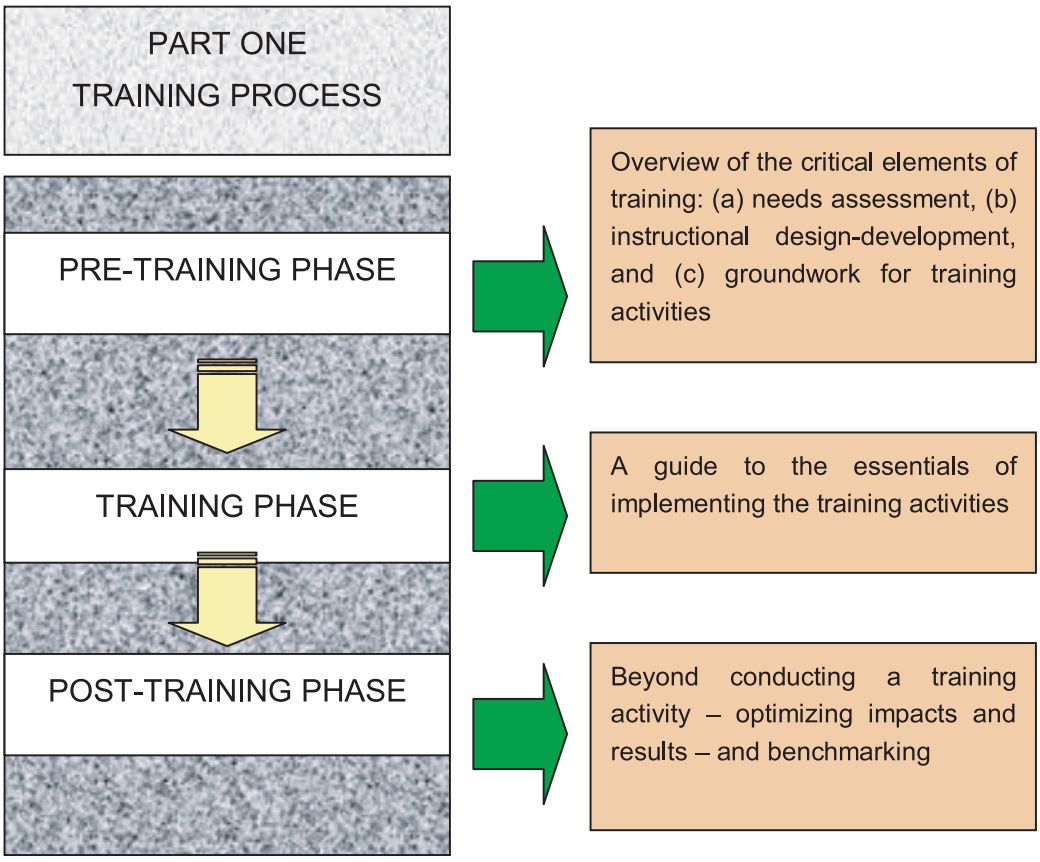
Contents

Part One of the Trainers Handbook outlines the training process, providing insight into the target audience and identifying key teaching concepts. Part Two maps out the training activity, with emphasis on integral components such as the objective, coverage, methodology and participant profile. Ideally for a five-day course, the contents can easily be adapted for shorter term training sessions. It can also serve as an orientation material.

Part One : The Training Process

Phase One: Pre-Training is an overview of the critical elements in delivering a learning activity namely, (a) assessing needs, (b) developing the teaching design and (c) laying the groundwork for training activities.

Structure of the Training Process



Phase Two: Training Phase outlines the essentials of implementing a training activity, including the fundamentals of facilitation and logistics.

Phase Three: Post-Training guides the trainer on how to maximize training outcomes and go beyond teaching towards benchmarking results.

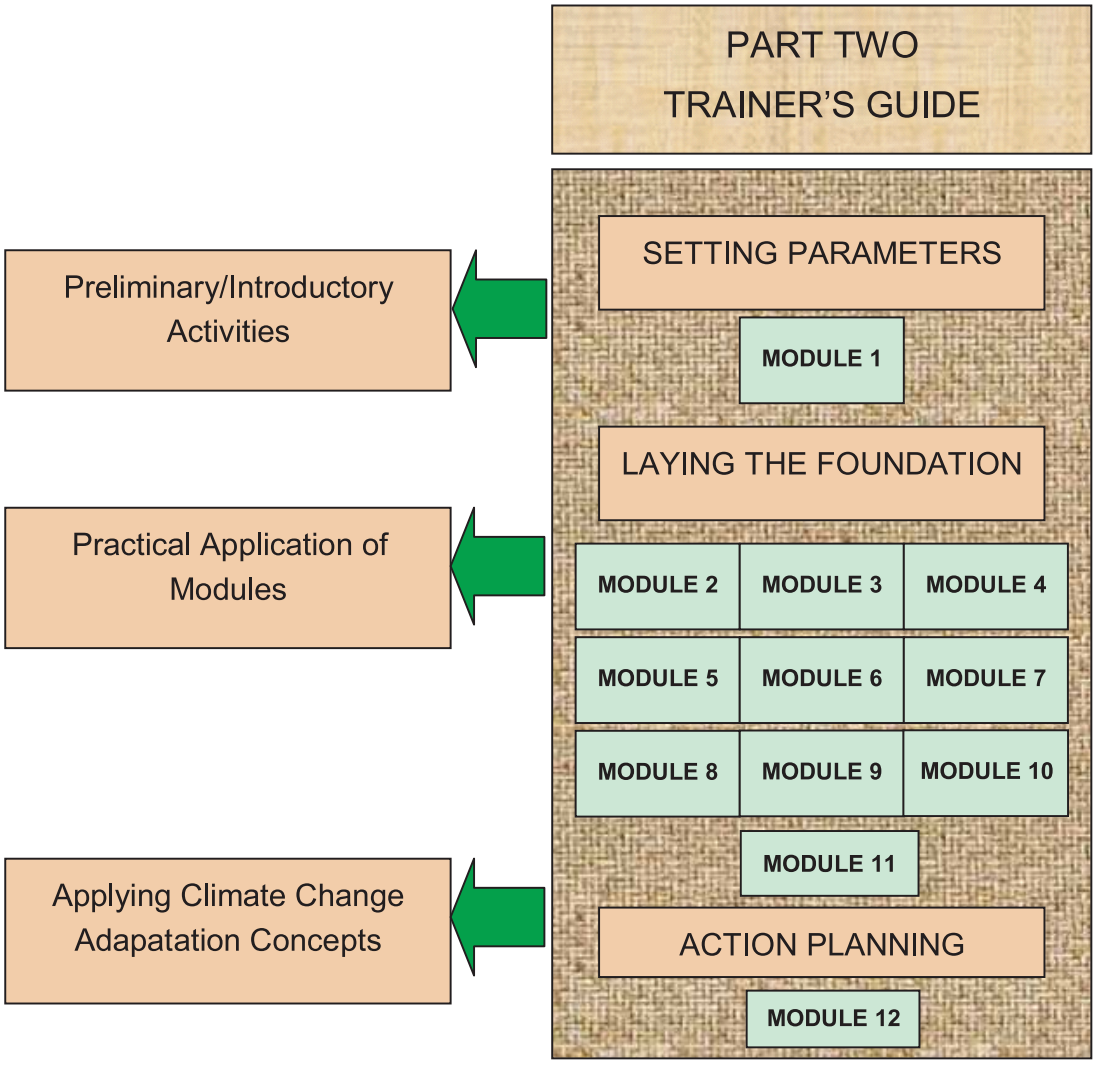
Part Two : The Trainer's Guide

Setting Parameters: Preliminary or introductory activities. The environment is set and participants are primed for the learning experience.

Laying the Foundation: The part of the training where modules are applied. This is when basic concepts on climate change are translated to relevant and practical terms.

Action-planning: The ultimate purpose and final output of the training. Ideas are crystallized and specific, measurable, attainable, realistic and time bound goals are formed toward applying climate change adaptation concepts in development work.

Structure of the Trainer's Guide



Part Three : The Learning Module

The **Learning Modules** is comprised of ELEVEN (11) modules, each addressing topics of relevance to the targeted participants. To facilitate designing and implementation of training sessions or a course, templates for tables and matrices are provided. These standardized guides may also be used in workshops and related activities.

The LEARNING MODULES are

1. INTRODUCTION TO THE COURSE
2. CLIMATE CHANGE: THE SCIENTIFIC BASIS
3. IMPACTS OF CLIMATE CHANGE
4. VULNERABILITY TO CLIMATE CHANGE
5. RESPONSE TO CLIMATE CHANGE
6. POLICIES AND INSTITUTIONS FOR CLIMATE CHANGE
7. ADAPTATION TO CLIMATE CHANGE
8. MAINSTREAMING ADAPTATION TO CLIMATE CHANGE
9. CLIMATE CHANGE AND GENDER
10. CLIMATE SMART DEVELOPMENT
11. MAKING PLANS AND PROJECTS CLIMATE RESILIENT
12. ACTION PLANNING

Each Module is supplemented with the following to facilitate Trainers while planning and conducting training:

a) Reference Materials for Continuing Learning
b) Learning Methods, Tools, Techniques
c) Questions/Quiz to Assess Learning
d) Exercises
e) Case studies
f) Templates for Exercises and Planning

Each module contains a **Session Guide** and **Trainer's Notes.**

The **Session Guide** gives an overview of the module. It indicates the duration of the session, states the objectives and outlines the training procedures specific to the session.

Trainer's Notes are reference materials and supplementary talking points. Since the concepts discussed are basic, these could easily be simplified or enhanced depending on the users' needs. It is imperative to cite examples to which the participants can relate.

Handouts and PowerPoint Presentations of the Modules along with other reference materials may be developed to supplement the information in the Facilitator's Notes. It is up to the trainer to decide whether these will be made available to the participants.

Part One - The Training Process

The CCA training sessions are designed for adult learners. As such, participants and trainers alike should be engaged in the activities physically, psychologically and socially. The ultimate goals of training are to build capacity, apply lessons practically, and initiate a change in behavior. To achieve these, a trainer must have a working knowledge of Adult Learning Principles.

Adult learners are volunteers. The challenge is not motivating them but rather, sustaining their interest. Adult learners come with a wealth of knowledge and experience. Autonomous and self-directed, they generally find hierarchical roles uninspiring. Trainers need mostly to guide learners, not just supply them with facts that are seemingly meaningless to their life.

Adult learning has a higher purpose. Goal-oriented, they regard learning as a means to an end; they do not simply acquire knowledge for the sake of having knowledge. The training must have a value that is meaningful to the participants. Adult learning complements the work-life balance. The demands of learning must be commensurate to its benefits. The learning proper must not interfere with the individuals' personal or professional life.

Adult learning is permanent. Self-initiated learning lasts much longer than the education imposed by family or society. Because it holds much significance to adult learners, knowledge is absorbed readily and applied practically.

Principles for Adult Learning: The CCA Training Course uses Twelve (12) Principles for Effective Adult Learning. These are:

1. Need Assessment: The participation of the learner in naming what is to be learned.
2. Safety in the environment between trainer and learner for learning and development.
3. A sound relationship between trainer and learner for learning and development.
4. Careful attention to sequence of content and Reinforcement.
5. Praxis: Action with reflection or learning by doing.
6. Respect for learners as subjects of their own learning.
7. Cognitive, affective, and psychomotor aspects: ideas, feelings, actions.
8. Immediacy of the learning.
9. Clear roles and role development.
10. Teamwork using small groups.
11. Engagement of the learners in what they are learning.
12. Accountability: How do they know?

The course adopts a problem-oriented approach to instruction. Case studies, exercises and problem-solving groups are designed in a way that is relevant to the participant. The trainer is encouraged to integrate new information with the learners' knowledge stock. Equal emphasis must be put on the content and learning process.

The training activity has a definitive Training Flow, occurring in sequence: Phase One is the Pre-Training stage; Phase Two is the Training Proper; and Phase Three, Post-Training activities.

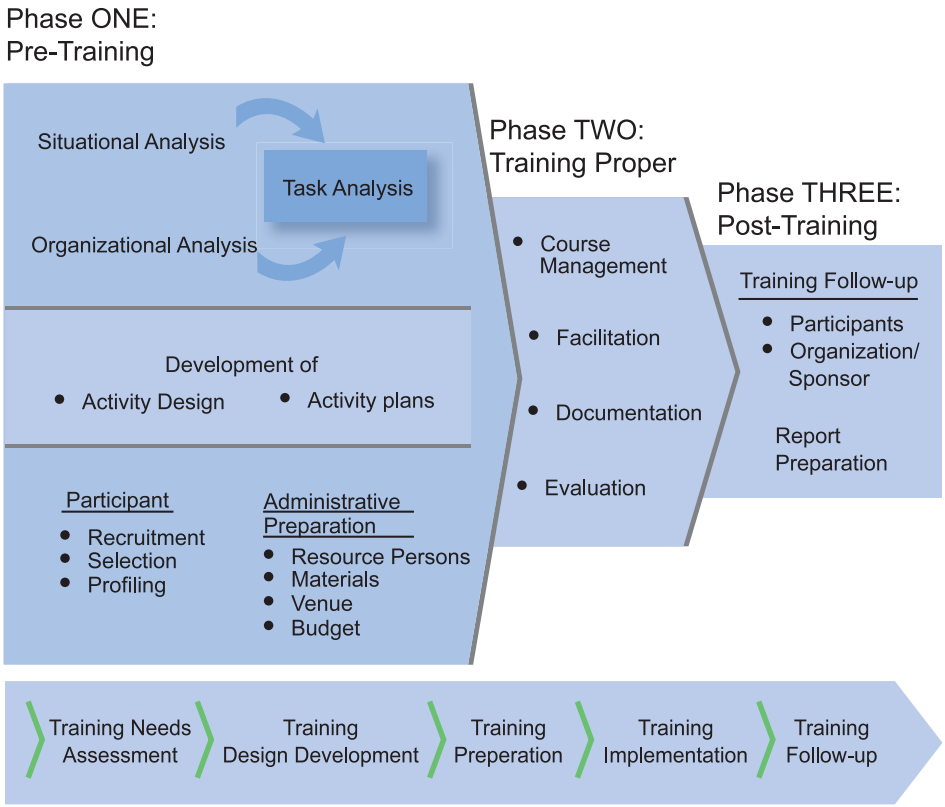


Figure 1: Flow of Activities for the Climate Change Adaptation Training Programme

Phase One: Pre-Training

An overview of critical elements of training: (a) needs-assessment, (b) instructional design development, and (c) groundwork for activities

Needs-Assessment is the process of identifying the existing competencies of the participants as regards:

- Distinguishing attributes and current situation (Situational Analysis).
- Affiliation with an organization and relevance of its' mandate to climate change adaptation (Organizational Analysis).
- Tasks required of individuals; how relevant their respective job responsibilities are to climate change adaptation (Task Analysis).

Climate Change Adaptation requires looking through a "climate lens" when viewing development initiatives. It necessitates integrating climate change adaptation measures into development processes at the participant's level of work.

'Ideal' connotes the requisite competencies for integrating climate change adaptation

'Existing' indicates the participant's current level of competency.

'Training Needs' are the competency gaps that the training activity needs to address.

Figure 2: The Training Needs Equation

Training need assessment is often conducted with the use of information-gathering tools, including individual interviews, focus group discussions, meetings and questionnaires. If at the start of the training an initial task analysis of participants is improbable, a questionnaire could be used instead. The questionnaire could be distributed at registration stage and collected afterwards. Collation and analysis must be done prior to the design and implementation of the training activity.

Another option is to interview the organization's officers to ascertain the needs of both the group and personnel to be trained. Information generated therein could be included in the participants' individual personal profile. These could later be used for training design development.

Design Development could enhance the learning process. In the case of the CCA training activities, a standard course outline has been set. If necessary, supplementary training activity components can be adapted to the training needs.

Training design constitutes the what, why and how of the training activity. Modules and session guides could incorporate examples that strike a familiar chord in participants.

Activity plans are guidelines on implementing and managing the training:

- Documentation Plan-ascertain if the activity should be documented and reported, and how
- Evaluation Plan-determine factors for evaluating the activity
- Administrative/Logistics Plan-draw an administrative & logistical checklist prior to the training activity
- Management Plan-get a consensus on the formation of a training team. Ascribe tasks to members, and set protocols and work schedules.

Training Preparation includes sourcing the required human and material resources, doing legwork and coordinating with subcontractors as needed.

- Administrative/Logistics Plan-Draw up an administrative and logistical to-do list prior to the training activity.
- Management Plan-Obtain a consensus on the formation of a training team. Ascribe tasks to members, and set protocols and work schedules.

Participants

Recruiting suitable participants is critical to ensuring that training goals are met. Participants are often pre-selected by the agencies/departments and are not subjected to a proper selection process. It is

important to discuss with the organization their criteria and expectations from their staff after the training. Selected participants must then fill-up a registration form.

Administrative preparations

A. Invited Resource Persons must be informed of:
   - The results of the training need assessment: the situation that is being addressed, details of the organization being supported, and training needs that have been identified
   - The rationale, details and expected outputs of the overall training activity and specific session they are to handle.
   - The module and session guides should be discussed, modifying the prototypes as needed
   - Participants' profiles. These include results of the training-needs assessment and a rundown of demographics and other relevant information (e.g., number of participants, age range, gender, job responsibilities and, when available, the expectations of the participants and organizations).

B. Materials consist of standard printouts, including hand-outs and forms, and visual aids like PowerPoint presentations of the training topic. Trainers could print on the materials (i) logos of partner and sponsoring institutions; (ii) date and venue of the training activity; and (iii) pictures, local samples and other information to be used. Once edited and finalized, these are ready to be reproduced and packaged for the training kits. Coordination with resource persons is imperative to determining the materials to be used and how these should be presented.

C. Venue should be well-suited to the type of training activity. The decisive factors should be:
   - The training room (size and shape; accessibility to dining and lodging areas, restrooms; artificial and natural lighting; acoustics; ventilation; tables, chairs, audio-visual equipment; electrical outlets; boards/panels)
   - Accommodations (number of participants per room; accessibility to training venue)
   - Food (people's food restrictions; quality and quantity of food; dining arrangements)

D. Budget or financial resource requirements need to be identified, money requested and approval acquired.

Phase Two: The Training Phase

A guide to the essentials of implementing training activities

1. **Facilitation** should be guided by the pre-set parameters and principles. To enhance the learning experience:
   - Speak clearly, making sure that you are heard by all.
   - Address learners' expectations early on.
   - Explain the module structure and components at the start of each session.
   - Provide refreshers on previous discussions to ensure that everyone understood the material covered.
   - Answer questions as they arise, if unsure, simply say you will look into the matter and get back.
   - Give useful and constructive feedback.
   - Stick to the schedule but have a contingency plan in case the session takes longer than expected.

2. **Documentation** captures critical information. Implementing the documentation entails taking down notes, recording audio and video, and taking photos. Documentation is an integral input to the report and a good source of feedback. Correctly label and carefully store materials for easy referencing.

3. **Evaluation** gives direction to the training. The evaluation plan allows the trainer to get immediate feedback on the status of participants during training (formative evaluation), and at the end of the activity (summative evaluation). The output of evaluation could enhance the training design and facilitate management of the activity.

4. **Administrative/Logistic Monitoring** entails timely preparation and distribution of materials. Venue and other pertinent provisions should be monitored closely.

5. **Overall training activity management**, when done properly, yields an impeccable training session. Ironing out the curriculum and implementing the various plans is contingent to the efficiency of the training team.

Phase Three: Post-Training

Beyond conducting a training activity, the imperative is optimizing impacts and results, and benchmarking.

1. **Training report** preparation must be guided by an established documentation plan. The report must contribute to the review and revision of the training design, processes planning and implementation. It includes the daily documentation, evaluation results and course output.

2. **Training follow-up** with the partner agency, organization and sponsors includes soliciting feedback on accomplishments, concerns and recommendations after the training. This enhances post-course support to participants and the overall integration of learning into organizational operations.

MODULE 1

INTRODUCTION TO THE COURSE

INTRODUCTION TO THE COURSE

MODULE 1

OVERVIEW OF MODULE

DURATION		Training Course: 1 hour 15 minutes
OBJECTIVES		At the end of the Module 1, the participants will have: 1. established an environment conducive to learning 2. leveled-off expectations with the training team 3. been oriented on process, content of the training activity 4. laid down mechanism for the duration of the course (workshop groupings, host teams, house rules, etc.)
COVERAGE		A. Introduction: • Team-building activity B. Leveling off expectations: • Individual expectations • Collation and synthesis of participants' expectations C. Overview of the training activity: • Rationale • Objectives • Activity flow
SUGGESTED METHOD		Structured learning exercise: Team building • Expectations check • Presentation of: (a) course objectives (b) training activity flow and schedule: • Formation of host teams and workshop groups • Setting up house rules
OUTPUTS		• Fostered team spirit • Identified and discussed expectations on the training activity • Outlined the scope and focus of the activity
RESOURCES Supplies and Equipment Visual Aids Handouts		• Manila paper, VIPP cards, markers, paper tape • White board, white board markers • LCD projector, computer • Training activity design: objectives, framework, schedule

SESSION GUIDE

A. INTRODUCTION

DURATION		Training Course: 15 minutes
OBJECTIVES		At the end of the session, the participants and training team would have: 1. introduced themselves to each other 2. set a positive learning atmosphere
KEY POINTS		Collective effort from the participants and training team (team work)
SUGGESTED METHOD		Structured learning exercise: Team building (to be identified by training team) (a) instructions (b) process questions
RESOURCES		To be identified (training team)

B. LEVELLING EXPECTATIONS

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, the participants would have shared their expectations on the training activity
COVERAGE		Recognition & comprehension of each other's expectations
SUGGESTED METHOD		Option 1: For an orientation course • The facilitator requests participants to share their expectations on the training activity • The facilitator consolidates participants' responses, listing each on the template matrix • Once the facilitator has generated sufficient responses, the final output are presented and discussed

		Option 2: For a training course • Participants write on a piece of paper at least two expectations in relation to their personal concerns • Participants are grouped and instructed to share their individual responses. The facilitator consolidates participants' responses, listing each on the matrix • The facilitator reviews, validates and discusses each group's output

KEY POINTS		Collation and synthesis of expectations: • Collate expectations based on themes specified below • Group expectations that have similar ideas or themes • Present synthesis of expectations in preparation for the overview of the training activity

Proposed matrix of collation/synthesis:

CONTENT	PROCESS	FACILITATOR	PARTICIPANTS	MANAGEMENT CONCERN

Guiding questions for above matrix:

- **Content:** What do you want to discuss?
- **Process:** How do you want to discuss it?
- **Facilitators/Resource Person:** What do you expect from the training team/resource persons?
- **Participants:** What do you expect from your co-participants?
- **Management Concerns:** Time management, host teams, etc.

RESOURCES Supplies and Equipment Visual Aids		• Manila paper, meta cards, markers, masking tape • White board, white board markers • LCD projector, computer • Matrix

C. OVERVIEW OF TRAINING COURSE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, the participants would have: 1. been oriented on the training activity design 2. discussed the activity in the context of their work/job 3. set the learning parameters for the training activity
KEY POINTS		• Levelling off understanding of training activity objectives, coverage and schedule • The training activity rationale and process as it contributes to the organizations to which participants belong • Learning parameters for duration of the training activity: (a) host teams (organizers) (b) time management (c) other concerns
SUGGESTED METHOD		Orientation on the training activity design • Presentation of training activity objectives, coverage, flow • Discussions of the prepared design in relation to the participants' expectations; clarification and leveling off

CONTENT	PROCESS	FACILITATOR	PARTICIPANTS	MANAGEMENT CONCERN

In relation to

coverage	methodology	learning contract
Modules	Expert presentations and Discussions Exercises	Host Teams Time management Other concerns

RESOURCES Supplies and Equipment Visual Aids		• White board, white board markers • LCD projector, computer • Participants' matrix of expectations • Training activity design: Objectives, framework, schedule

MODULE 1

INTRODUCTION TO THE COURSE

TRAINERS GUIDE

AGENDA

A. **Introduction**, with Team-building activity
B. **Levelling off expectations**, including Individual expectations, and Collation and synthesis of expectations
C. **Overview of the training activity**, including Rationale, Objectives, Activity flow

A. INTRODUCTION

TEAM BUILDING ACTIVITY	Team-building activity: The team-building activity can be as casual as an energizer or as formal as a structured learning exercise. The objective is for the participants and training team to be acquainted with each other, and create a positive learning environment for themselves.

B. LEVELLING EXPECTATIONS

DISCUSS INDIVIDUAL EXPECTATIONS FROM THE TRAINING COURSE WITH REGARD TO

CONTENT	Inputs that would emerge from the training activity, including objectives and coverage
PROCESS	Strategies and methodologies that would be used in the training activity, including the schedule of activities
FACILITATOR	Expectations on the facilitators in terms of teaching style and methodology in delivering inputs, including the use of visual aids and handouts
PARTICIPANTS	Expectations from participants in terms of how they conduct themselves in the training activity
MANAGEMENT ISSUES	Matters related to the administrative details of the training activity, including food, accommodation and materials

C. OVERVIEW OF TRAINING COURSE

RATIONALE	This is the main reason for conducting the training activity. The facilitator should supplement the discussion with official documents (e.g. proposal); and highlight the significance of the training to the sponsor or host organization.

OBJECTIVE OF THE TRAINING COURSE	At the end of the training activity, the participants would have: 1. improved individual and institutional capacity to analyze and formulate climate change adaptation policies and strategies 2. integrated adaptation measures into development plans and processes

COVERAGE	Please refer to the Content Structure and Module

COURSE SCHEDULE	Please refer to the Training Activity Design

OBJECTIVES	1. BEEN ORIENTED ON THE COVERAGE OF THE TRAINING COURSE	2. IMPROVED INSTITUTIONAL CAPACITIES TO ANALYSE CLIMATE RISKS	3. IMPROVED CAPACITY TO INTEGRATE ADAPTATION MEASURES THROUGH CLIMATE MAINSTREAMING AND CLIMATE SMART MANAGEMENT (PLANS/PROCESSES)	4. MAPPED NEXT COURSE OF ACTIONS
COVERAGE	PRELIMINARY M1 INTRODUCTION TO THE TRAINING COURSE	UNDERSTANDING CLIMATE CHANGE M2-M10		ACTION PLANNING M11
METHOD	INDIVIDUAL AND GROUP REFLECTIONS	EXERCISES PLENARY DISCUSSIONS CONSOLIDATION		EXERCISES SUMMARIZING

MODULE 1

INTRODUCTION TO THE COURSE

MODULE CONTENTS

BACKGROUND TO CLIMATE CHANGE ADAPTATION TRAINING

In Bangladesh, people continue a struggle for human development amidst bountiful natural resources. Natural hazards, predominantly climate induced hazards have a long history of devastating impact on the land and people, claiming lives, damaging infrastructure, destroying assets, sources of income and affecting livelihoods. In the past two decades, accelerated global warming induced climate variability and change has led to observed events and phenomena. In a world confronting a possible 2 to 4 degree celsius of temperature rise over this Century, Bangladesh is recognized as one of the countries most vulnerable to the adverse impacts of climate change.

Bangladesh has specific development aspirations and needs which consider the survival and well-being of its people at the forefront. Development planning is a conscious effort that matches resources and optimizes their use to address identified needs and aspirations.

Development aspirations are dis-aggregated into Sector-wise goals, targets. Policies and Strategies are provided to enable processes that translate plans into action. Institutions, government and non-government, act as instruments with their mandates to perform and achieve goals, targets. To this end, it is crucial that development planning in Bangladesh takes consideration of disaster risks from hazards and risks from climate variability and change.

Integrating disaster risk reduction and climate change adaptation into mainstream development plans and processes is broad, multi-dimensional, and involving "a process of culture of resilience in nations and communities".

OBJECTIVES: The key objectives of the training course/activity will be to

- improve the capacities to understand climate change and challenges to development
- improve capacities to understand adaptation to climate change and how to address integration in plans, projects and processes

METHOD: The training adopts a participatory approach, utilizing tables, figures, matrices and diagrams to complement the ELEVEN (11) modules. The exercises are essentially action learning-oriented. The Training Activity Flow shows the links running through the training activity objectives, content and method.

COVERAGE and CONTENT: The CCA Training Handbook is designed to ensure coverage of required information to address key identified learning needs on selected topics. The contents selected to address learning needs through the training is presented in a table the following page.

SETTING PARAMETERS	MODULE 1 INTRODUCTION TO THE COURSE	The training context and the learning environment must be set before the Modules begin. Module 1 sets the tone of the course. At this stage, exercises for participant introductions, setting of expectations and overview of activities are conducted and general objectives are identified.
LAYING THE FOUNDATION	MODULE 2 CLIMATE CHANGE: THE SCIENTIFIC BASIS	The scientific understanding of climate change is the basic foundation for learning. Module 2 discusses what climate change is about, and what is causing rapid global warming. The implications of a warming world, particularly for countries like Bangladesh and the likely future in a world experiencing warming are also highlighted.
	MODULE 3 IMPACTS OF CLIMATE CHANGE	Rapid global warming will have severe consequences on the well being of our planet and lives. Early evidence already demonstrates the likelihood of a challenging future. Module 3 discusses what the impacts of climate change are, where the impacts are already felt and likely to be most felt and impacts of climate change in Bangladesh.
	MODULE 4 VULNERABILITY TO CLIMATE CHANGE	Impacts of climate change will be different across ecosystems, human societies and economies, depending on exposure and adaptive capacity. Module 4 discusses what vulnerability to climate change means, assessing vulnerability, who and what are vulnerable, and Bangladesh's vulnerability to climate change.
	MODULE 5 RESPONSE TO CLIMATE CHANGE	Recognizing climate change impacts and vulnerability, nations and communities worldwide are taking response measures. Module 5 discusses key response measures taken so far, progress made in this regard, and future challenges, as a global collective and as one of the most vulnerable country.
	MODULE 6 POLICIES & INSTITUTIONS FOR CLIMATE CHANGE	In the absence of an overarching policy on climate change, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is the de facto policy document that provides strategic direction for work on climate change related issues. Module 6 describes climate change related policies in Bangladesh, the institutional arrangements to support response to climate change and different types and sources of adaptation financing available in the coutry.
	MODULE 7 ADAPTATION TO CLIMATE CHANGE	Managing the consequences of unavoidable climate change impacts involves reducing vulnerability and increasing adaptive capacity. Module 7 discusses concepts and approaches to adaptation to climate change, that adaptation to climate change is a development imperative, not an option. Also, relationship between adaptation and reducing disaster risks is highlighted. Examples of adaptation in different development sectors are shared, including opportunities linking with mitigation actions and generation and use of climate information to plan adaptation actions.
	MODULE 8 MAINSTREAMING ADAPTATION TO CLIMATE CHANGE	Climate change risks and adaptation needs to be integrated into mainstream development planning and processes. Module 8 discusses policies, institutions and processes for adaptation mainstreaming, including adaptation financing. Approaches and steps to consider for mainstreaming are also discussed.
	MODULE 9 CLIMATE CHANGE AND GENDER	Vulnerability is a reflection of the state of the individual and the individual and collective conditions are shaped by many factors, among which gender plays a key role. Module 9 discusses gender-based disparities and explore how unequal exposure and vulnerability of women to the effects of climate change.
	MODULE 10 CLIMATE SMART DEVELOPMENT	Government Officers must prepare themselves and their organizations to respond effectively to climate risks and vulnerability to impacts. Module 10 discusses elements and characteristics of "climate smart" development, "climate smart" organization, and steps and actions to enable "climate smart" organizations/development.
	MODULE 11 MAKING PLANS AND PROJECTS CLIMATE RESILIENT	Climate Proofing is the process of systematically undertaking an analysis on climate risk reduction and increase of adaptive capacity. Module 11 discusses the concept, principles and approaches for climate resilient development. The method and process to conduct climate resilient development also is explained. Useful tips are discussed which can ensure successful results.
ACTION PLAN	MODULE 12 ACTION PLANNING	In Module 12, participants engage in identifying opportunities and planning conscious actions over a timeline to chart out a roadmap, with indicators to measure progress along the climate smart development pathway.

MODULE 2

CLIMATE CHANGE: THE SCIENTIFIC BASIS

CLIMATE CHANGE: THE SCIENTIFIC BASIS

MODULE 2

OVERVIEW OF MODULE

DURATION		Training Course: 90 minutes
OBJECTIVES		At the end of the Module 2, the participants will have: 1. gained a working knowledge of the concepts and implications of climate change, and the importance of climate change adaptation initiatives 2. been oriented on Bangladesh's climate scenarios and trends 3. been familiarized that climate change is a development concern
COVERAGE		What is climate change? What is causing rapid global warming? What is the future likely to be? Overview of adaptation to climate change and development Exercise - 1: Climate Change Link to Development Goal.
SUGGESTED METHOD		Structured learning exercise: Film show or Group activity Exercise - 1: Climate Change Link to Development Goal.
OUTPUTS		A systematic understanding of the science of climate change and a holistic perspective of climate change adaptation and development
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board and Marker, LCD Projector, Computer Power point presentations Module 2 Contents

SESSION GUIDE

A. WHAT IS CLIMATE CHANGE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to: 1) explain the basic concepts of weather, climate, climate change, variability, etc. and 2) explain what is causing rapid global warming which leads to changing climate
KEY POINTS		Definition of terms and concepts applied in the training Climate Change is "Any change in climate over time, whether due to natural variability or as a result of human activity." Factors affecting climate Our Future in a warming world
SUGGESTED METHOD		Film show Group activity Participants reflection on the exercise Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Documentary Film Module 2 Contents

B. WHAT IS CAUSING RAPID GLOBAL WARMING?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to understand and explain causes of rapid global warming and links to climate change.
COVERAGE		What causes global warming, global warming process and trends; Factors responsible for rapid warming, name/list of greenhouse gases, sources of greenhouse gases, emission levels and trends, emission-warming relationship.

SUGGESTED METHOD		Presentation and Discussion

KEY POINTS		Greenhouse gas emissions and concentration levels in the atmosphere are directly related to global warming. Human activities over the past two centuries have released GHGs accelerating global warming. Some of the consequences of global warming are unavoidable and therefore calls for management through adaptation. To avoid a world where GHG concentration in atmosphere keeps climbing leading to unmanageable consequences, emissions must be reduced by all countries according to global agreements.

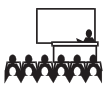
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Documentary Film Module 2 Contents

C. WHAT IS THE FUTURE LIKELY TO BE IN A WORLD EXPERIENCING WARMING?

DURATION		Training Course: 30 minutes

OBJECTIVES		At the end of the session, participants will be able to explain the probable future of the World, South Asian region, and Bangladesh will likely experience for different warming projections.

KEY POINTS		Global warming trends and projections are based on current scientific understanding of how different elements in our climate behave as GHG concentration levels change over time. Scientists have projected a number of scenarios for the future for different levels of warming, and the likely impacts and consequences for different parts of the world

SUGGESTED METHOD		Presentation and Discussion

RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Our Future in a Warming World

CLIMATE CHANGE: THE SCIENTIFIC BASIS

MODULE 2

TRAINERS GUIDE

TOPICS FOR DISCUSSION

The scientific understanding of climate change is the basic foundation for learning. Module 2 discusses what climate change is about, and what is causing rapid global warming. The implications of a warming world, particularly for countries like Bangladesh and the likely future in a world experiencing warming are also highlighted.

CONTENTS

A. WHAT IS CLIMATE CHANGE?

To start answering this question, we first need to understand weather and climate.

Weather is the condition of the atmosphere of a particular place over a short period of time. The parameters are temperature, rainfall, humidity, sunshine hour and wind speed.

Climate

1. Long-term average weather pattern in one place
2. Influenced by slow changes in the climate system (i.e. interactions between the ocean, the land, the orbit of the earth around the sun, and the energy output of the sun)
3. The climate system is in turn affected by an area's latitude, elevation, terrain, and distance from coasts, mountains and lakes
4. Fundamentally the climate is controlled by the balance of energy of the earth and its atmosphere

Climate change

- A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere which is in addition to natural climate variability observed over a comparable period of time"

  - United Nations Framework Convention on Climate Change (UNFCCC)

- Any change in climate over time, whether due to natural variability or as a result of human activity"

  - Intergovernmental Panel on Climate Change (IPCC)

Greenhouse effect

Greenhouse effect refer to the rise in global temperature due to the process by which the gases in the atmosphere trap the heat coming from the sun that is re-radiated by the earth's surface and re-emit it downwards. Because of how they warm our world, these gases are referred to as greenhouse gases or GHGs (i.e. water vapor, clouds, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and halocarbons).

How GHGs are produced

Natural sources of GHGs

1. By natural processes such as the water cycle, growth and death of plants and animals, decaying of

woods and other biodegradable materials and volcanic activities. These are the naturally occurring gases, such as carbon dioxide (CO_2), methane CH_4 and nitrous oxide (N_2O) that keep the earth comfortably warm enough for plants and animals to live in an average temperature of 15°C. The scientific community as a whole has concluded that naturally occurring greenhouse gases have remained fairly constant over the last several hundred years. Without greenhouse gases Earth's temperature would be too cold for human and other living species.

Anthropogenic sources of GHGs

2. According to Intergovernmental Panel on Climate Change (IPCC) Global Green House Gas (GHG) emission due to human activities have grown since pre-industrial times, but especially over more than last 160 years, since the Industrial revolution. Major sources of GHG generation by activities are;

   - Increased carbon dioxide (CO_2) emissions. Burning of fossil fuels like oil, coal, natural gas and others due to electricity generation, transportation, manufacturing process, including steel, cement and lime production, land-use, land-use change and forestry (deforestation).
   - Increased methane (CH_4) emission into the atmosphere in flooded rice fields, wasters from dairy production, rotting organic maters in landfills, and leaks from coal mining and natural gas production.
   - Nitrous oxide (N_2O) is responsible for 8% of the enhanced greenhouse effect produced from intensive agriculture including cultivated soils and nitrogen fertilizer and pesticide use, biomass burning, combustion processes in vehicles, acid production process.

Why does climate change occur?

Climate change occurs because an excessive amount of greenhouse gas is being emitted into the atmosphere due to human activity. Some solar energy that reached the Earth in natural state gets absorbed into the atmosphere and some portion leaves the Earth, and here, greenhouse gases prevent solar energy from going into space and to remain inside the atmosphere (Fig. 2.1).

Greenhouse gases in natural state have been exercising positive role for appropriate amount of solar energy to go into space and proper amount remain in earth to help living organisms to maintain an optimal temperature for living organisms to live. Unfortunately, the earth's climate is increasing as excessive amount of heat is trapped inside the earth's atmosphere because humans emit too much greenhouse gases. Therefore, the cause of climate change is the increasing greenhouse gases (specially, carbon dioxide) due to human activity.

The representative greenhouse gases are carbon dioxide, nitrous oxide and methane and there are few more (water vapour, sulfur hexafluoride, hydrofluorocarbons, perfluorocarbons etc). Compared to the carbon dioxide, methane has 60 greater force of holding heat energy, but the remaining time in the atmosphere is relatively short. Methane is contained in wetlands, gas, and burp. Large amount of methane is released in the livestock industry, so one of the important behaviors that we should take to stop climate change is to start eating more vegetables and reduce the meat diet.

Nitrous oxide has 270 times greater capacity of holding heat inside the atmosphere and remains inside the air for 150 years. Nitrous oxide is emitted while fossil fuels are burned and also from nitrogenous manure.

The reason why carbon dioxide is considered as the major cause of climate change when other greenhouse gases have strong energy of holding the heat and remains inside the atmosphere for quite long period of time is because the increasing amount of emitted carbon dioxide is quite large.

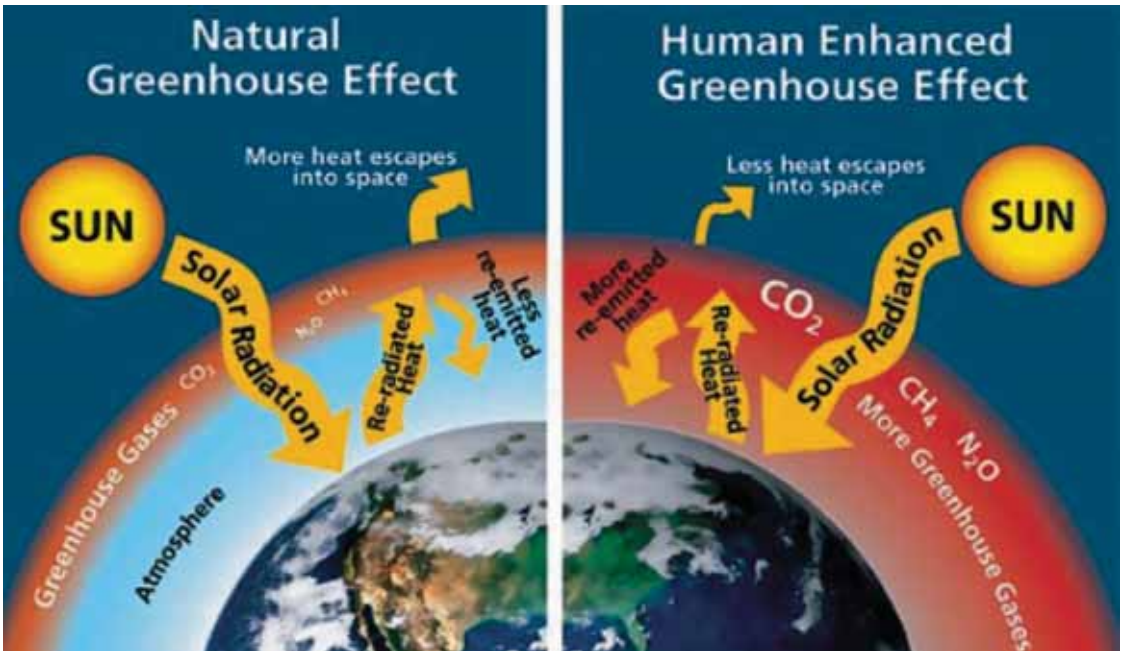


Figure 2.1 The Natural Greenhouse Gas Effect and Human Enhanced Greenhouse Effect

Take a look at the three graphs below and observe the relationship between the increasing amount of carbon dioxide concentration and the temperature.

Before nineteenth century when Industrial Revolution began, the concentration of carbon dioxide within the atmosphere was approximately 280 parts per million (ppm), but the concentration of today is approximately 400ppm, which show that it has increased tremendously.

If you take a look at the graph (Fig. 2.2), the concentration of carbon dioxide has remained around 280 ppm for hundreds of years, but has made drastic increase since 1800's. The second graph represents the Keeling Curve that has measured the amount of carbon dioxide in the atmosphere from 1958. This data was measured on top of Mauna Loa Mountain in Hawaii, and this mountain was selected because it was considered to be the place that was least affected by the atmospheric pollution.

This graph (Fig. 2.3) clearly shows growth in carbon dioxide concentration. The concentration of carbon dioxide which was approximately 310ppm in 1958 has marked 381ppm in 2005. According to WMO's Greenhouse Gas Bulletin, on the global scale, the amount of CO2 in the atmosphere reached 393.1 parts per million in 2012, or 141% of the pre-industrial

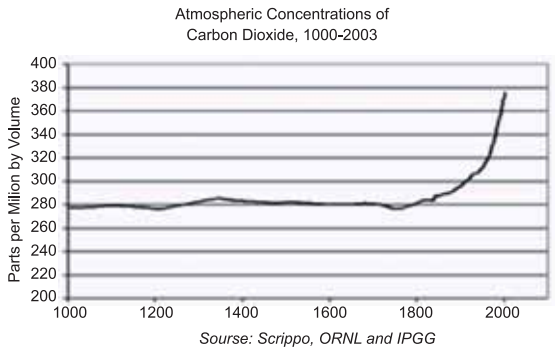


Figure 2.2 Concentrations of Carbon Dioxide

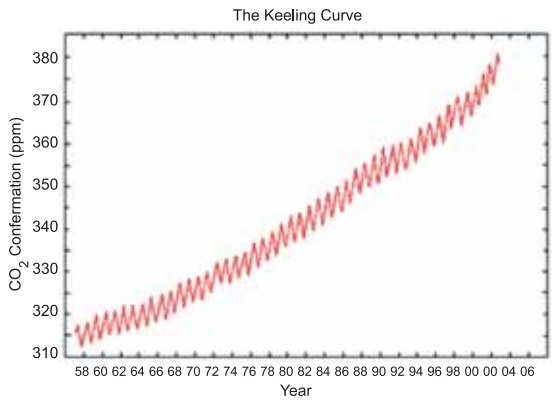


Figure 2.3 Growth of Carbon Dioxide

level of 278 ppm. The reason why concentration goes up and down every year is because the concentration level decreases while trees are absorbing carbon dioxide according to the season in the northern hemisphere and the concentration increases again when it is winter in northern hemisphere.

The graph (Fig. 2.4) is the combination of carbon dioxide concentration tendency and average temperature of the Earth. As in this graph, the tendency of average temperature is making gradual increase as the carbon dioxide concentration increases.

An illustration of the correlation between CO_2 concentrations and temperature increase[12]

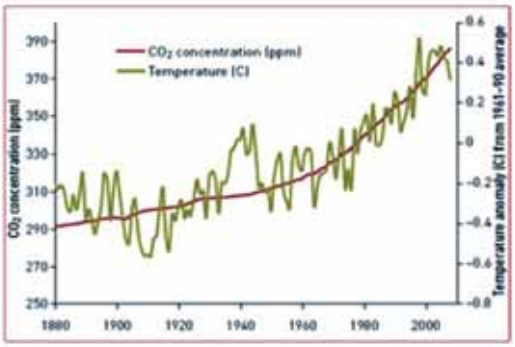


Figure 2.4 Correlation of Carbon Dioxide and Temperture

Indicators of a Warming World

Scientists have studied and selected key indicators that describe our world is warming.

There will be increases in temperatures over both land mass and oceans, temperatures near surface and sea surface, in humidity patterns, and ocean heat content. In addition, tree lines will shift poleward and upward, with increases in species migration. Indicators showing decreases are glaciers, snow cover, sea ice and ice sheets. It has also been observed that springs are coming earlier.

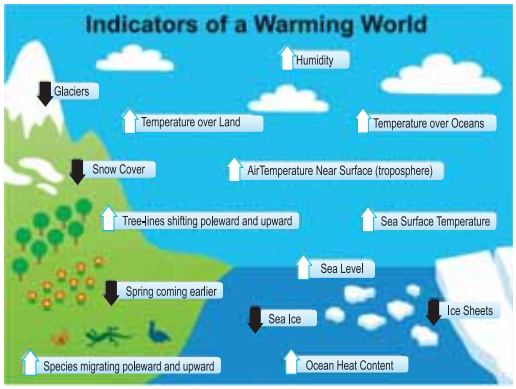


Figure 2.5 Warming Indicators

B. WHAT IS CAUSING RAPID GLOBAL WARMING?

These graphs are partial scientific evidence that the increasing greenhouse gas concentration at the atmosphere is the cause of global warming. According to the IPCC (Intergovernmental Panel on Climate Change), global warming is evidently occurring and the phenomenon of temperature increasing has been observed. They clearly stated in the 4th Assessment report that the above phenomenon since the mid-20th century is due to the accumulation of greenhouse gases that the human race has emitted. IPPC received the Nobel Peace Prize in 2007 when they published this report. Some still insist that there are other causes for global warming not because of excessive greenhouse gas emission, but the figures are merely few and most scientists agree with IPCC's conclusion or consider IPCC to have underestimated the threat of climate change.

For example, IPCC report did not consider the feedback effect of quantity. When earth's temperature increases, arctic permafrost will melt. Then, greenhouse gases confined below are expected to be released into the atmosphere and this will increase the average temperature of the Earth again. The Arctic ice cap reflects most of solar radiation and sea water absorbs most of heat. When ice cap melts into the ocean, the amount of reflected solar energy will decrease whereas the absorbed energy is expected to be much greater. Such phenomenon is referred to the amount of feedback. When this phenomenon gets out of control, the climate change becomes irreversible. Therefore, it is urgent to take preventive measure in advance.

C. THE FUTURE IN A WORLD EXPERIENCING RAPID WARMING

Warming trends: Climate model projections were summarized in the 2007 Fourth Assessment Report (AR4), by the Intergovernmental Panel on Climate Change (IPCC). They indicated that during the 21st century the global surface temperature is likely to rise a further 1.1 to 2.9 °C for their lowest emissions scenario and 2.4 to 6.4 °C for their highest. The Fifth Assessment Report of IPCC (2014) has reconfirmed these projections and concluded that warming may happen at a faster pace than before

The ranges of these estimates arise from the use of models with differing sensitivity to greenhouse gas concentrations. It should be noted that scientists, activists, policy makers, planners, professionals, political leaders, development and financial institutions worldwide recognize that greenhouse gas emission and concentration in the atmosphere most likely accelerating global warming.

Future Risks Worldwide: Future climate change and associated impacts will vary from region to region around the globe. The effects of an increase in global temperature include a rise in sea levels and a change in the amount and pattern of precipitation, as well a probable expansion of subtropical deserts.

Warming is expected to be strongest in the Arctic and would be associated with the continuing retreat of glaciers, permafrost and sea ice. Other likely effects of the warming include a more frequent occurrence of extreme weather events including heat waves, droughts and heavy rainfall, ocean acidification and species extinctions due to shifting temperature regimes.

If average temperature increases more than 2 degrees than the mean atmospheric temperature prior to the Industrial Revolution, scientists are predicting that there is a greater chance of feedback occurrences. So far, the earth's average temperature has increased by 0.6 degree compared to the pre-Industrial Revolution. There has been universal agreement to prevent not more than 2 degrees of temperature rise than before Industrial Revolution took place, but how to realize such matter still remains as a big challenge.

Climate projections and Uncertainty: Global concentrations of greenhouse gases (GHGs) in the atmosphere have been rising since the industrial revolution as a result of human activities. During the 20th century, Earth's mean global temperature rose by almost 0.74 °C and is expected to increase by a further 1.1 °C to 6.4 °C by the end of the 21st century (IPCC 2007). Mean global sea levels are also expected to rise by 2100, although the exact extent is still a topic of heated debate, with estimates ranging from 18 cm to 140 cm (IPCC 2007).

Other climate variables will also be affected by a global rise in temperature. An increase in global precipitation is projected, but this increase will very likely be spread unevenly across different regions: high latitude and equatorial regions are expected to receive more precipitation and mid-latitude regions a range of changes. Projected precipitation patterns are far from certain, with considerable variations likely even within the given ranges. Many subtropical areas are expected to become drier.

In addition to changes in the mean values for temperature, sea level rise, and precipitation, climate change will also lead to greater variability in the weather, as well as more weather extremes. Events such as floods, droughts, heat waves and cyclones are expected to become more frequent and intense.

It must be emphasized that in most cases there is a degree of uncertainty associated with these climate projections. In part this uncertainty arises from the scale of analysis: global averages can be projected with much more certainty than projections for specific locations.

The level of uncertainty also differs across different aspects of climate change, with more accurate projections available for temperature than for precipitation. Nevertheless, despite this uncertainty, it is highly unlikely that there will be no change at all. Therefore, while climate information is being improved, the available climate projections should already be used to identify and counteract possible impacts.

Climate Change and Climate Extremes - Current Understanding: The character and severity of impacts from climate extremes depend not only on the extremes themselves but also on exposure and vulnerability. In IPCC SREX, adverse impacts are considered disasters when they produce widespread damage and cause severe alterations in the normal functioning of communities or societies. Climate extremes, exposure, and vulnerability are influenced by a wide range of factors, including anthropogenic climate change, natural climate variability, and socioeconomic development (Fig.2.3).

Disaster risk management and adaptation to climate change focus on reducing exposure and vulnerability and increasing resilience to the potential adverse impacts of climate extremes, even though risks cannot fully be eliminated (Figure.2.4).

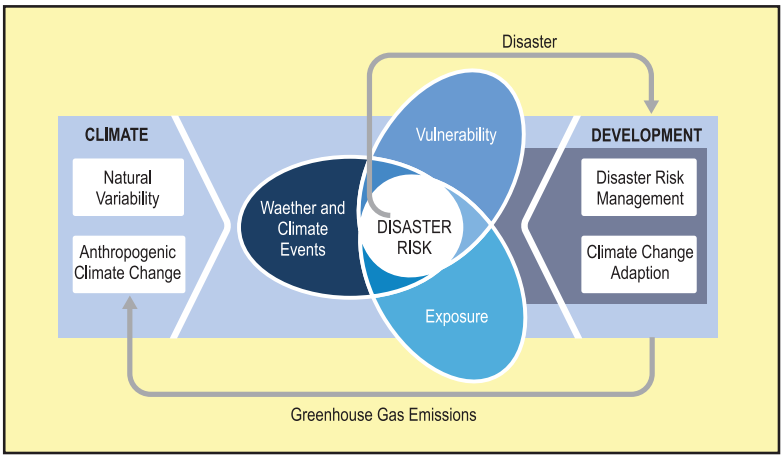


Figure 2.6 Relationships between Climate, Disaster Risks and Development

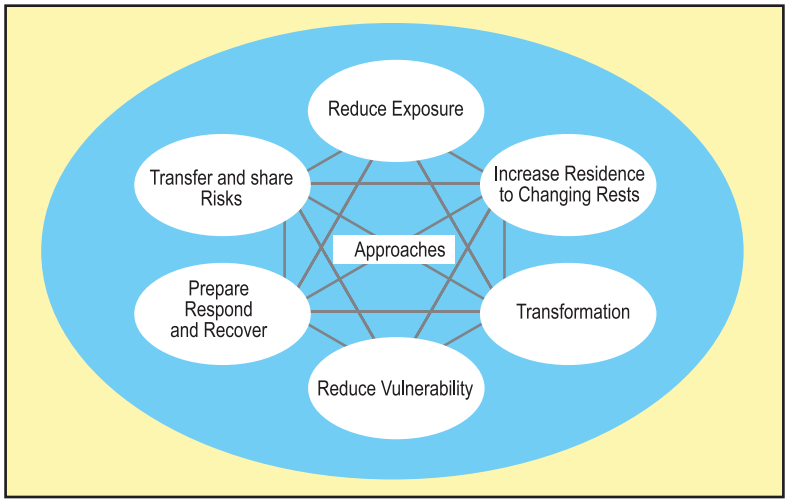


Figure 2.7 Adaptation and disaster risk management approaches to reduce and manage disaster risks in a changing climate. The approaches can be overlapping and can be pursued simultaneously (IPCC SREX, 2012).

KEY MESSAGES The key messages of IPCC SREX are:

- Exposure and vulnerability are key determinants of disaster risk and of impacts when risk is realized.
- Extreme and non-extreme weather or climate events affect vulnerability to future extreme events, by modifying resilience, coping capacity, and adaptive capacity.
- A changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events.
- Exposure and vulnerability are dynamic, varying across temporal and spatial scales, and depend on economic, social, geographic, demographic, cultural, institutional, governance, and environmental factors.
- Settlement patterns, urbanization, and changes in socioeconomic conditions have all influenced observed trends in exposure and vulnerability to climate extremes.
- There is evidence from observations gathered since 1950 of change in some extremes. Confidence in observed changes in extremes depends on the quality and quantity of data and the availability of studies analyzing these data, which vary across regions and for different extremes. Assigning "low confidence" in observed changes of a specific extreme on regional or global scales neither implies nor excludes the possibility of changes in this extreme.
- There is evidence that some extremes have changed as a result of anthropogenic influences, including increases in atmospheric concentrations of greenhouse gases.
- Economic losses from weather- and climate-related disasters have increased, but with large spatial and inter-annual variability.
- Economic, including insured, disaster losses associated with weather, climate, and geophysical events are higher in developed countries. Fatality rates and economic losses expressed as a proportion of GDP are higher in developing countries.
- Increasing exposure of people and economic assets has been the major cause of the long-term increases in economic losses from weather- and climate-related disasters.
- The severity of the impacts of climate extremes depends strongly on the level of the exposure and vulnerability to these extremes.
- Trends in exposure and vulnerability are major drivers of changes in disaster risk.
- Development practice, policy, and outcomes are critical to shaping disaster risk, which may be increased by shortcomings in development
- Inequalities influence local coping and adaptive capacity, and pose disaster risk management and adaptation challenges from the local to national levels.
- Post-disaster recovery and reconstruction provide an opportunity for reducing weather and climate-related disaster risk and for improving adaptive capacity.
- Closer integration of disaster risk management and climate change adaptation, along with the incorporation of both into local, sub-national, national, and international development policies and practices, could provide benefits at all scales.
- Confidence in projecting changes in the direction and magnitude of climate extremes depends on many factors, including the type of extreme, the region and season, the amount and quality of observational data, the level of understanding of the underlying processes, and the reliability of their simulation in models.

- Models project substantial warming in temperature extremes by the end of the 21st century.
- It is likely that the frequency of heavy precipitation or the proportion of total rainfall from heavy falls will increase in the 21st century over many areas of the globe. This is particularly the case in the high latitudes and tropical regions, and in winter in the northern mid-latitudes.
- Measures that provide benefits under current climate and a range of future climate change scenarios, called low-regrets measures, are available starting points for addressing projected trends in exposure, vulnerability, and climate extremes. They have the potential to offer benefits now and lay the foundation for addressing projected changes.

CLIMATE TREND ANALYSIS: BANGLADESH CONTEXT

Bangladesh Meteorological Department (BMD) has studied observed data of 31 years period (1977-2008). Key findings are summarized as follows:

Temperature: Temperature has increased. However, the increase is not uniform all over the country. Temperature extremes have been observed. Temperature drops to as low as record breaking 4^{o} C in some parts of northern Bangladesh has been observed.

Table 2.1 Trend of Climate

Indicator	Annual increase	Cumulative Increase 1977 – 2008
Mean annual temperature increase	0.016^{o} C/year	0.496^{o} C
Mean maximum temperature increase	0.002^{o} C/year	0.062^{o} C
Mean minimum temperature increase	0.012 ^{o} C/year	0.372^{o} C

Rainfall: Observed changes in the rainfall pattern appear to be mixed with trend of increased rainfall in the coastal region.

In all the seasons an overall increase in the mean seasonal rainfall is observed. It was found to be maximum during Pre-monsoon (March - May) and during Monsoon (June-August) season by around 100 mm, although the Post-monsoon winter season experiences the minimum rainfall.

SUGGESTED READING

IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the fifth Assessment Report of the Intergovernmental Panel on Climate Change available at www.ipcc.ch

IPCC, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp. Available at www.ipcc.ch

Ministry of Environment and Forests; 2012; Second National Communications of Bangladesh to the United Nations Framework Convention on Climate Change; Government of the People's Republic of Bangladesh. Available online at: www.moef.gv.bd

World Bank 2012: Turn Down the Heat: Why a 40C Warmer World must be Avoided. The Potsdam Institute for Climate Impact Research and Analysis.

UK Met Office; 2011; Climate: Observations, projections and impacts - Bangladesh; United Kingdom

MODULE 3

IMPACTS OF CLIMATE CHANGE

CLIMATE CHANGE: THE SCIENTIFIC BASIS

MODULE 3

OVERVIEW OF MODULE

DURATION		Training Course: 60 minutes
OBJECTIVES		At the end of the Module 3, the participants will learn and be able to explain 1. key impacts of climate change worldwide; 2. where the impacts are already felt and likely to be felt; 3. observed and predicted impacts of climate change in Bangladesh
COVERAGE		A. What are Impacts of Climate Change Key observed Impacts of climate change worldwide B. Where the Impacts are already felt Key impact and impact risk areas and locations C. Climate Change Impacts in Bangladesh Observed impacts and impact risks
SUGGESTED METHOD		Presentation and Discussion Question and Answer Video Documentary (Optional)
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT ARE THE IMPACTS OF CLIMATE CHANGE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the impacts of climate change observed worldwide.
KEY POINTS		Global warming is already having significant and costly effects on our climate, our health, and our environment. Global warming has serious worldwide implications, though the type and magnitude of local effects varies considerably by region. This session highlights the consequences of global warming on a broad level. • Climate change is already taking place. Rural areas will be particularly affected as it impacts on water resources, agriculture, overall biodiversity and ecosystems like forests and coastal zones, as well as human health. Major impacts of climate change are: • Rapid Sea Level Rise and Increased Coastal Flooding • More Frequent and Intense Heat Waves • Costly and Growing Health Impacts • An Increase in Extreme Weather Events • Heavier Precipitation and Flooding • Disruptions to Food Supplies • Changing Seasons • Plant and Animal Range Shifts • Melting Ice • Destruction of Coral Reefs • The Potential for Abrupt Climate Change
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 3 Contents

B. WHERE ARE THE IMPACTS MOST FELT

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain where the impacts of climate change are being felt
COVERAGE		Climate Change has serious implications for a number of sectors and resources, including agriculture, water availability and quality, and ecosystems like coastal zones. They will also have influence on the frequency and magnitude of natural hazards particularly extreme weather related events
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 3 Contents

C. IMPACTS OF CLIMATE CHANGE IN BANGLADESH

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the impacts of climate change and variability in Bangladesh
KEY POINTS		o Over 100 million people in rural Bangladesh depend on climate-sensitive sectors for their livelihood and are at maximum risk from climate change. The impacts of climate change and climate variability in Bangladesh need to be understood first by understanding impacts on bio-geophysical systems and their implications on human society, economy, development, etc.

COVERAGE		Global warming and the resultant climate change will have profound effects on the water resources of Bangladesh (both surface and ground water). This is most likely to result in (a) i***ncreased flooding***, both in terms of extent and frequency; (b) ***increased moisture stress*** during dry periods leading to increased drought susceptibility in terms of both intensity and frequency; and (c) ***increased salinity intrusion*** during the low flow conditions. These changes in the physical system of the country will directly affect a number of major productive systems. These include (a) crop agriculture, (b) livestock production, (c) aquaculture and fish production, (d) coastal shrimp production, and (e) forest and vegetation. Due to changes in temperature and humidity, ***human health*** will also be affected. The high susceptibility to water-based natural hazards will affect ***settlement*** of the population and also ***physical structures and infrastructure***.

SUGGESTED METHOD		Presentation and Discussion

RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 3 Contents

CLIMATE CHANGE: THE SCIENTIFIC BASIS

MODULE 3

TOPICS FOR DISCUSSION

Rapid global warming will have severe consequences on the well being of our planet and lives. Early evidence already demonstrates the likelihood of a challenging future. Module 3 discusses what the impacts of climate change are, where the impacts are already felt and likely to be most felt and impacts of climate change in Bangladesh

MODULE CONTENTS

Understanding the potential impacts of climate change is essential for informing both adaptation strategies and actions to avoid dangerous levels of climate change. A range of valuable national studies have been carried out and published, and the Intergovernmental Panel on Climate Change (IPCC) has collated and reported impacts at the global and regional scales. But assessing the impacts is scientifically challenging and has, until now, been fragmented. To date, only a limited amount of information about past climate change and its future impacts has been available at national level, while approaches to the science itself have varied between countries.

A. WHAT ARE THE IMPACTS OF CLIMATE CHANGE?

Global warming is already having significant and costly effects on our climate, our health, and our environment. Global warming has serious worldwide implications, though the type and magnitude of local effects varies considerably by region. This page highlights the consequences of global warming on a broad level starting from primary effects to broader level of impacts in both temporal and spatial sacle.

Unless we take immediate action to reduce global warming emissions, these impacts will continue to intensify, grow ever more costly and damaging, and increasingly affect the entire planet - including you, your community, and your family.

Rapid Sea Level Rise and Increased Coastal Flooding: Average global sea level has increased eight inches since 1880. Global warming is now accelerating the rate of sea level rise, increasing coastal flooding risks to low-lying communities and high-risk coastal properties whose development has been encouraged by today's flood insurance system.

More Frequent and Intense Heat Waves: Dangerously hot weather is already occuring more frequently than it did 60 years ago-and scientists expect heat waves to become more frequent and severe as global warming intensifies. This increase in heat waves creates serious health risks, and can lead to heat exhaustion, deadly heat stroke, and aggravate existing medical conditions.

Costly and Growing Health Impacts: Climate change has significant implications for our health. Rising temperatures will likely lead to increased air pollution, a longer and more intense allergy season, the spread of insect-borne diseases, more frequent and dangerous heat waves, and heavier rainstorms and flooding. All of these changes pose serious, and costly, risks to public health.

An Increase in Extreme Weather Events: Strong scientific evidence shows that global warming is

increasing certain types of extreme weather events, including heat waves, coastal flooding, extreme precipitation events, and more severe droughts. Global warming also creates conditions that can lead to more frequent and more intense cyclones.

***Heavier Precipitation and Flooding*:** As temperatures increase, more rain falls during the heaviest downpours, increasing the risk of flooding events.

***Disruptions to Food Supplies*:** Rising temperatures and the accompanying impacts of global warming - including more frequent heat waves, heavier precipitation in some regions, and more severe droughts in others - has significant implications for crop and meat production. Global warming has the potential to seriously disrupt our food supply, decrease agricultural yield drive costs upward, and affect everything from tea to cattle, from staple food crops to the garden in your backyard.

Changing Seasons

***Plant and Animal Range Shifts*:** A changing climate affects the geographic range of plants and animals, changing their behavior and causing disruptions up and down the food chain. The range of some warm-weather species will expand, while those that depend on cooler environments will face shrinking habitats and potential extinction.

***Melting Ice*:** Temperatures are rising in the planet's polar regions, especially in the Arctic, and the vast majority of the world's glaciers are melting faster than new snow and ice can replenish them. Scientists expect the rate of melting to accelerate, with serious implications for future sea level rise.

***Destruction of Coral Reefs*:** As global temperatures rise, so too do average sea surface temperatures. These elevated temperatures cause long-term damage to coral reefs. Scientists have documented that sustained water temperatures of as little as one degree Celsius above normal summer maxima can cause irreversible damage.

***The Potential for Abrupt Climate Change*:** Scientists know that Earth's climate has changed abruptly in the past. Even though it is unlikely to occur in the near future, global warming may increase the risk of such events.

B. WHERE ARE THE IMPACTS MOST FELT?

Climate change impacts The climatic changes described above will have serious implications for a number of sectors and resources, including agriculture, water availability and quality, and ecosystems like coastal zones. They will also have influence on the frequency and magnitude of natural hazards particularly extreme weather related events..

Very minor changes to temperature can have major impacts on systems on which human livelihoods depend, including changes to water availability and crop productivity, the loss of land due to sea level rise and the spread of disease.

The lives and livelihoods of many different communities will be at risk. Rural areas are highly vulnerable to climate change, since people there depend heavily on natural resources such as local water supplies and agricultural land. In fact, about 70 % of the population in developing countries lives in rural areas, where agriculture is their main source of livelihood (IPCC 2007b).

***Present Impact of Climate Variability and Extreme in Bangladesh*:**
The most damaging effects of erratic behaviour of present climate and extreme events are flood,

drought, salinity intrusion, cyclone and storm surges that will drastically and adversely affect crop productivity in almost every year.

About 1.32 million hectares of cropland is highly flood-prone and about 5.05 million hectares are moderately flood- prone. Besides crops, perennial trees and livestock are affected by flood every year. In two severe flood years of 1974 and 1987, the shortfalls in production from trend were about 0.8 and 1.0 million metric ton (Mmt) of rice, respectively. During 1984, flood affected both Aus and Aman rice crop and the shortfall was about 0.4 Mmt.

Drought of different intensities in Kharif, Rabi and pre-Kharif seasons causes damage to 2.32 million hectares of T. Aman and 1.20 m ha of Rabi crops annually. Yield reductions due to drought vary from 45-60% in T. Aman and 50-70% in Rabi crops in very severe drought situation. In the severe drought year of 1979, the shortfall was about 0.7 million tons. During 1981 and 1982, droughts affected the production of monsoon crop (Aman) and the shortfalls from the trend were 0.5 and 0.3 Mmt, respectively.

C. IMPACTS OF CLIMATE CHANGE IN BANGLADESH

***Bangladesh: Impacts of Climate Change and Variability*:** The impacts of climate change and climate variability in Bangladesh need to be understood first by understanding impacts on bio-geophysical systems and their implications on human society, economy, development, etc.

***Impacts of Climate Change on Bio-geophysical Systems and Implications*:** Global warming and the resultant climate change will have profound effects on the water resources of Bangladesh (both surface and ground water). The country is highly susceptible to:

(a) ***increased flooding*:** both in terms of extent and frequency;
(b) ***increased moisture stress*:** during dry periods leading to increased drought susceptibility in terms of both intensity and frequency; and
(c) ***increased salinity intrusion*:** during the low flow conditions.

The above mentioned changes will directly affect a number of ***major productive systems***. These include (a) crop agriculture, (b) livestock production, (c) aquaculture and fish production, (d) coastal shrimp production, and (e) forest and vegetation.

Due to changes in temperature and humidity, ***human health*** will also be affected. The high susceptibility to water-based natural hazards will affect ***settlement*** of the population and also physical structures and infrastructure.

Current understanding on anticipated impacts of climate change on bio-physical systems of the country is discussed:

***Flood and Water-logging*:** The projected increase in rainfall during monsoon would be reflected in the flow regimes of the rivers of Bangladesh. Increased flooding and drainage congestion, therefore, are the expected consequences of increased rainfall from a warmer and wetter condition.

The increased run-off would also aggravate the existing drainage problems and create new ones. Bangladeshi rivers, especially the major ones, have lost gradient during the past several decades. Consequently, their conveyance capacity is diminished significantly. An increase in monsoon rainfall, therefore, will complicate drainage problem further resulting in increasing duration of floods (Ahmed et al., 1998a). The 'best-estimate' scenario for the year 2030 is that monsoon rainfall could increase by 10 to 15 per cent. For the scenario year 2075 the average rainfall in monsoon will increase by about 27% with respect to the base year.

In the coastal areas there will be stronger-than-usual backwater effect due to sea level rise induced high oceanic stage, resulting in slowing of discharge flow, particularly along the confluence points of the major rivers. As a consequence, the risk of riverine and rainfall-induced high intensity floods with prolonged duration, as in the case of flood 1998, will increase significantly.

Rise in sea level along the coastal belt would not only inundate low-lying areas along the coast, it would also create a favorable condition for saline waters to overtop the flood protecting coastal embankments, especially when induced by strong winds (CEGIS, 2006). Polders are at risk of submergence in southwestern Districts. Breach of existing coastal embankments will also inundate land with saline waters.

With increased rainfall, both the height and timing of peak flood levels might change (ADB, 1994; BUP-CEARS-CRU, 1994; Warrick and Ahmad, 1996). Alam et al. (1998) examined flood susceptibility of Bangladesh under climate change scenario. Based on the findings, increased flooding would alter the relative proportions of the different land types based on flood depths, viz., F0, F1, F2, F3 and F4. The implication is that the proportion of F0 (highland) would decrease, while the other land types (F1 to F4) would increase through a cascading effect of re-categorization of land types of different flood depths.

Under climate change scenario about 18 per cent of current lowly flooded areas will be susceptible to higher levels of flooding while about 12 to 16 per cent new areas will be at risk of varied degrees of inundation. On an average hydrological year, flood prone areas will increase from about 25 per cent to 39 per cent.

In absence of any information on susceptibility to flash-floods under climate change induced hydrological regime, it is difficult to assess how the country would be affected. Similarly, targeted research are yet to take place to understand whether new areas will become more prone to water-logging as a response to increased monsoon intensity under climate change regime.

Drought Under climate change scenario evapo-transpiration will increase significantly, especially during the post-monsoon and pre-monsoon seasons, in the backdrop of diminishing rainfall in winter and already erratic rainfall variability over time and space (Karim et al., 1998).

As a consequence, severity of moisture stress, particularly in the north-western districts will increase leading to drought conditions. An earlier estimate suggests that the area severely affected by drought in Rabi season could increase from 4000 km^2 to 12000 km^2 under severe climate change scenario (Huq et al., 1996).

High index of aridity in winter, especially in the western parts of the country may be compensated by increased withdrawal from the surface water sources. If that is the case, despite the minimum flow in the Ganges as provided by the Ganges Water Sharing Treaty (GOB-GOI, 1996) it would be extremely difficult to provide adequate freshwater flows in the downstream of the Ganges dependent areas, particularly during the dry season. Combating excessive aridity will require either augmented inflows of the Ganges from the upstream or increased ground water withdrawal in those areas (Halcrow et al., 2001b).

Low Flow and Salinity Ingress In a normal hydrological cycle, rivers suffer from low flow conditions when there is no appreciable rainfall runoff. Typically low flow condition starts to occur in the post-monsoon period and continues till early April, March being the critical month. During low flow surface salinity penetrates further inland due to lack of adequate flushing. Under climate change scenarios low flow conditions are likely to aggravate with the possibility of withdrawal of appreciable rainfall in winter (Ahmed et al., 1998a).

The southwestern parts of the country will be particularly vulnerable, since the region depends on freshwater flows along the Ganges and its major tributary, Gorai. People in the southwestern region have expressed their concerns regarding increasing salinity (RVCC, 2003). Bangladesh NAPA and BCCSAP also highlight the concerns regarding salinity ingress, especially for the southwestern region (GOB, 2005).

Cyclone and Storm Surge: The coastal zones of the country will be increasingly vulnerable to climate change driven cyclonic storm surge. Not only the frequency of occurrence of cyclones along the Bay of Bengal would increase as a response to rising Sea Surface Temperature (SST), cyclonic intensity would also increase, with a corresponding increase in surge height in newly inundated shoreline. It is, however, also argued that the surge height along the continental shelf would somewhat decrease as a consequence of sea level rise (Ali, 1999).

IPCC states, "… there is some evidence that regional frequencies of tropical cyclones may change but none that their locations will change. There is also evidence that the peak intensity may increase by 5% to 10% and precipitation rates may increase by 20% to 30%" (IPCC 2001).

Among several major implications for Bangladesh are; First, projections on no-change in cyclone tracks under climate change means that Bangladesh is likely to remain vulnerable to cyclonic hazards with perhaps a higher possibility of formation of cyclones in a warmer world. This is in agreement with the results provided by Ali (1999). Moreover, the fact that peak intensities may increase by 5-10% has serious implications for a country already very vulnerable to storm surges. Finally, an increase in 20-30% in the associated precipitation could only make the concerns even more serious, particularly in the coastal embanked areas where heavy rainfall can instantaneously inundate otherwise protected agricultural lands (Ahmed, 2005a).

Results from research suggests, due to sea-level rise driven backwater effect and resulting head difference along the southern reaches of a few identified coastal embankments, the embankments will face increasing water-logging, which will be accentuated by intense rainfall events under climate change (CEGIS, 2006).

SUGGESTED READING

CDMP II, 2014; Local Level Hazard Maps for Flood, Storm Surge and Salinity. Ministry of Disaster Management and Relief, Dhaka. Available online at: www.cdmp.org.bd

CDMP II, 2014; Development of Four Decade Long Climate Scenario and Trend: Temperature, Rainfall, Sunshine and Humidity. Ministry of Disaster Management and Relief, Dhaka. Available online at: www.cdmp.org.bd

CDMP II, 2014; Vulnerability to Climate Induced Drought: Scenario and Impacts. Ministry of Disaster Management and Relief, Dhaka. Available online at: www.cdmp.org.bd

Ministry of Environment and Forests, 2012; Second National Communications of Bangladesh to the United Nations Framework Convention on Climate Change; Government of the People's Republic of Bangladesh. Available online at: www.moef.gv.bd

UK Met Office; 2011; Climate: Observations, projections and impacts - Bangladesh; United Kingdom

MODULE 4

VULNERABILITY TO CLIMATE CHANGE

VULNERABILITY TO CLIMATE CHANGE

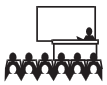
MODULE 4

OVERVIEW OF MODULE

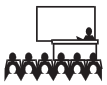
DURATION		Training Course: 60 minutes
OBJECTIVES		At the end of the Module 4, the participants will learn and be able to explain 1. What we mean by vulnerability to climate change 2. Bangladesh's Vulnerability to Climate Change
COVERAGE		A. Vulnerability to Climate Change Definitions and concepts. Elements or reasons for vulnerability, a vulnerability framework, steps in assessing vulnerability to climate change, Climate Change Vulnerability Index B. Bangladesh's Vulnerability to Climate Change Climate change projections, Climate Change Impacts Projections on • crop yield • food security • water stress and drought • health problems • flooding and rainfall • strain on the social fabric • coastal region
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT IS VULNERABILITY TO CLIMATE CHANGE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain what vulnerability to climate change means, assessing vulnerability, who and what is vulnerable, and Bangladesh's vulnerability to climate change.
KEY POINTS		How vulnerable a country or society is to the effects of climate change depends not only on the magnitude of climate stimuli or their effects but also on the sensitivity and capacity of the affected system to cope with or adapt to such stress. Sensitivity to climatic stress is generally high when societies depend on natural resources or ecosystems, e.g. agriculture and coastal zones. Adaptive capacity - the ability to adapt and cope with climatic stress - relies on various factors, such as wealth, technology, education, and access to resources. The vulnerability framework describes vulnerability as a function of exposure to the impacts of climate change, sensitivity of the system and adaptive capacity. It takes into account that socio-economic systems can reduce or intensify the impacts of climate change. While vulnerability must be defined on a case-by-case basis, it can generally be said that poor communities are especially vulnerable to climate change, variability and climate extremes. This is due to their limited access to resources, secure housing, proper infrastructure, insurance, technology and information. To assess vulnerability to climate change, five simple procedures may be applied. Climate change projections needs to be assessed first, followed by an assessment of exposure of the element to climate change. Third, sensitivity of the element to climate change is assessed, followed with assessments of well-being of habitats and ecosystems. Finally, adaptive capacity is assessed. The Climate Change Vulnerability Index reflects the vulnerability of different countries to extreme climate-related events and changes in major climate parameters.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 4 Contents

B. BANGLADESH'S VULNERABILITY TO CLIMATE CHANGE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the country's vulnerability to climate change
KEY POINTS		Bangladesh is most vulnerable to global warming and climate change adverse impacts. The vulnerability include Crop yield: Major decreases in Rice and Wheat crops Food security: Challenged due to increased flood risks Water stress and drought: Increase Flooding: Increase Coastal region: increase in Sea level Rise and Salinity
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 4 Contents

MODULE 4

VULNERABILITY TO CLIMATE CHANGE

TRAINERS GUIDE

TOPIC FOR DISCUSSION

Impacts of climate change will be different across ecosystems, human societies and economies, depending on exposure and adaptive capacity. Module 4 discusses what vulnerability to climate change means, assessing vulnerability, who and what is vulnerable, and Bangladesh's vulnerability to climate change.

MODULE CONTENTS

A. WHAT IS VULNERABILITY TO CLIMATE CHANGE?

How vulnerable a country or society is to the effects of climate change depends not only on the magnitude of climate stimuli or their effects but also on the sensitivity and capacity of the affected system to cope with or adapt to such stress. Sensitivity to climatic stress is generally high when societies depend on natural resources or ecosystems, e.g. agriculture and coastal zones. Adaptive capacity - the ability to adapt and cope with climatic stress - relies on various factors, such as wealth, technology, education, and access to resources.

Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes (IPCC 2007e).

Vulnerability is a function of the character, magnitude and rate of climate change and the degree to which a system is exposed, along with its sensitivity and adaptive capacity. It increases as the magnitude of climate change or sensitivity increases, and decreases as adaptive capacity increases (OECD 2009).

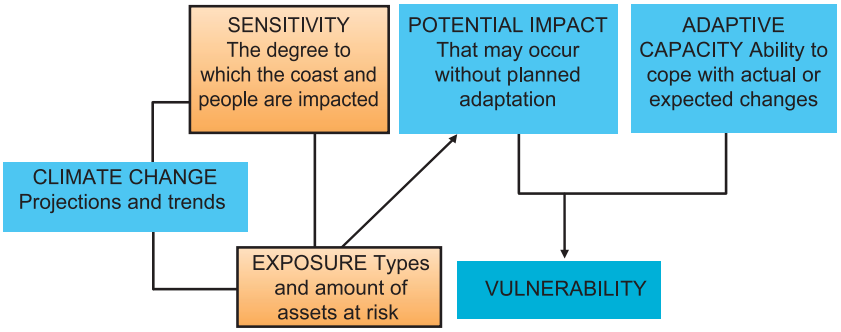


Figure 4.1 Vulnerability Framework

The vulnerability framework in the chart above describes vulnerability as a function of exposure to the impacts of climate change, sensitivity of the system and adaptive capacity. It takes into account that socio-economic systems can reduce or intensify the impacts of climate change.

Vulnerability of a given system or community depends on:

- the type and magnitude of climate change to which it is exposed (exposure);
- how sensitive or affected it is to this change (sensitivity);
- the extent to which the system is capable of adjusting or adapting to this change (adaptive capacity)

While vulnerability must be defined on a case-by-case basis, it can generally be said that poor

communities are especially vulnerable to climate change, variability and climate extremes. This is due to their limited access to resources, secure housing, proper infrastructure, insurance, technology and information.

To assess vulnerability to climate change, five simple procedures may be applied. Climate change projections needs to be assessed first, followed by an assessment of exposure of the element to climate change. Third, sensitivity of the element to climate change is assessed, followed with assessments of well-being of habitats and ecosystems. Finally, adaptive capacity is assessed.

Another way to consider vulnerability to climate change is to identify climate vulnerability/exposure (who are vulnerable, what are present and future stresses and threats) assess conditions and trends (what climate change related hazards, where they are likely to impact) analyze impacts (what are the impacts) and understand trends (how are the hazards changing).

In summary, assessing vulnerability to climate change should include assessment of Impacts (local climate projections and asset inventory), Vulnerability (Exposure, sensitivity and adaptive capacity), and Risks (Likelihood of impact, consequences to society, economy, environment).

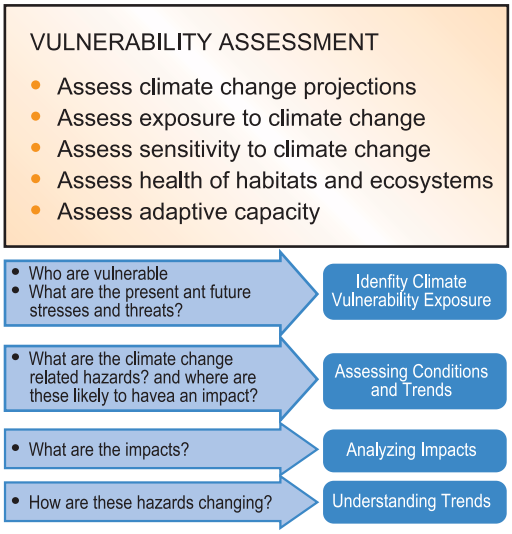


Figure 4.2 Vulnerability Assessment Process

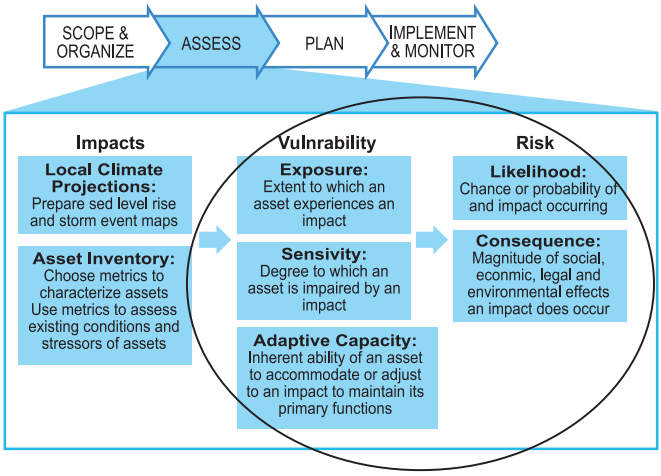


Figure 4.2 Vulnerability Assessment Process

The Climate Change Vulnerability Index (CCVI) 2011

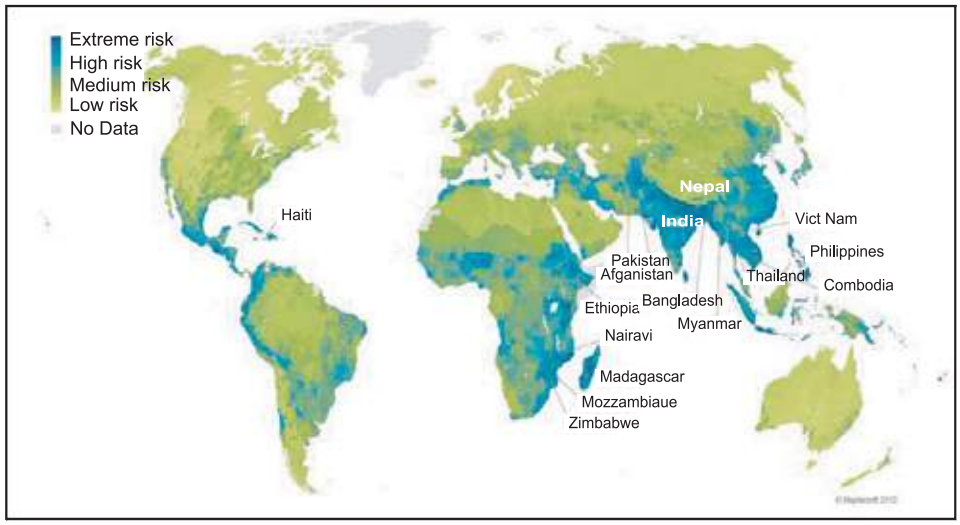


Figure 4.4 Climate Change Vulnerability Index

The Climate Change Vulnerability Index reflects the vulnerability of different countries to extreme climate-related events and changes in major climate parameters. It revealed that many countries are at 'extreme risk' from the impacts of climate change, and ranked Bangladesh among the top. Over the next 30 years it is expected that their vulnerability to climate change will increase due to predicted rises in air temperature, precipitation, humidity, sea level rise, salinity intrusion, increased frequency and intensity of cyclone, flood, drought in certain areas.

'Almost the whole of Indian sub-continent has a high or extreme degree of sensitivity to climate change, due to acute population pressure and a consequential strain on natural resources. This is compounded by a high degree of poverty, poor general health and the agricultural dependency of much of the populace.' (Maplecroft 2010)

B. BANGLADESH'S VULNERABILITY TO CLIMATE CHANGE

Crop yields

- Most of the global- and regional-scale studies project a decrease in the yields of rice and maize, two of Bangladesh's major crops, as a consequence of climate change.
- However the magnitude of the CO2 fertilization effect may yet determine whether crop yield losses or gains are realized under climate change. This represents a major source of uncertainty in crop projections.

Food security

- Bangladesh is currently a country with moderately high levels of undernourishment. Global-scale studies included here generally suggest that parts of Bangladesh could face worsening food security over the next 40 years.
- National-scale studies show that Bangladesh's food security is highly vulnerable to the impact of future flooding.

Water stress and drought

- There are currently few studies on the impact of climate change on water stress and drought in Bangladesh, especially at the national scale.
- From the few global and regional assessments available, climate change projections suggest that Bangladesh could be exposed to moderate to high water stress with climate change.
- Recent simulations by the AVOID programme broadly agree with global- and regional-scale studies that project an increase in water stress for Bangladesh as a whole. However, the uncertainty in the projected changes is large.

Health problems

- Diarrhoea outbreaks after floods and cyclones.
- Diseases caused by saline drinking water.
- Emergence of malaria, dengue due to water logging.
- Heat strokes in the high temperature.

Pluvial flooding and rainfall

- Recent studies indicate an increase in mean and extreme precipitation over Bangladesh. This supports conclusions from the IPCC AR4 and also AR5.
- However, large uncertainties remain, particularly with respect to how the large-scale Asian monsoon system might respond to climate change and changes in precipitation associated with tropical cyclones.

Fluvial flooding

- A number of studies suggest that fluvial flooding could increase in Bangladesh with climate change.

Strain on the social fabric

- Displacement due to climate change leading to tension in host communities; competition for basic facilities and services.
- Unplanned urbanization (migration influx over load).

Break-up of age-long reciprocal support systems.Coastal regions

- Several studies show that Bangladesh is one of the countries on the globe that is most vulnerable to sea level rise (SLR) impacts.
- More than 30% of the cultivable land in Bangladesh is in the coastal area.
- A 10% intensification of the current 1-in-100-year storm surge combined with a 1m SLR could affect around 23% of Bangladesh's total coastal land area.
- Out of 84 developing countries, Bangladesh was in the top 10 most impacted, in terms of population, GDP, urban area and agricultural land affected by a simulated 1m SLR combined with a 10% intensification of the current 1-in-100-year storm surge.

SUGGESTED READING

CDMP II, 2014; Development of Four Decade Long Climate Scenario and Trend: Temperature, Rainfall, Sunshine and Humidity. Ministry of Disaster Management and Relief, Dhaka. Available online at:

Ministry of Environment and Forests; 2012; Second National Communications of Bangladesh to the United Nations Framework Convention on Climate Change; Government of the People's Republic of Bangladesh. Available online at:

UK Met Office; 2011; Climate: Observations, projections and impacts - Bangladesh; United Kingdom

MODULE 5

RESPONSE TO CLIMATE CHANGE

RESPONSE TO CLIMATE CHANGE

MODULE 5

OVERVIEW OF MODULE

DURATION		Training Course: 90 minutes
OBJECTIVES		At the end of the Module 4, the participants will learn and be able to explain 1. What we mean by Response to Climate Change 2. The International Response to Climate Change 3. Bangladesh's Response to Climate Change
COVERAGE		A. Response to Climate Change, the three approaches Mitigation, Adaptation and institutional arrangement B. International Response to Climate Change, mainly through the UNFCCC process and responses relating to adaptation to climate change C. Bangladesh's Response to Climate Change, including action plans
SUGGESTED METHOD		Presentation and discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT IS RESPONSE TO CLIMATE CHANGE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the three main approaches currently practiced as response to climate change.
KEY POINTS		There are three main approaches currently practiced as response to climate change: 1. Mitigation Limit the cause of climate change through measures that could slow down the buildup of atmospheric GHGs concentrations by reducing current and future emissions and by increasing GHG sinks 2. Adaptation Increase the resilience and coping capacity of the sector with the current and future changes 3. Institutional actions
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 5 Contents

B. GLOBAL RESPONSE TO CLIMATE CHANGE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain Global response to climate change, and key milestones in response to climate change
KEY POINTS		Climate change is a complex problem, which, although environmental in nature, has consequences for all spheres of existence on our planet. It either impacts on– or is impacted by-- global issues, including poverty, economic development, population growth, sustainable development and resource management. It is not surprising, then, that solutions come from all disciplines and fields of research and development At the very heart of the response to climate change, however, lies the need to reduce emissions. In 2010, governments agreed that emissions need to be reduced so that global temperature increases are limited to below 2 degrees Celsius. A comprehensive adaptation framework/programme is being considered under the Bali Action Plan to be part of a future climate regime is envisaged to include provisions to integrate adaptation into national and sectoral planning processes, to develop knowledge, information and capacity for implementing concrete adaptation actions, to enhance adaptation technologies, to mobilize the cooperation of relevant organizations and to monitor and evaluate the support for adaptation action.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 5 Contents

C. BANGLADESH'S RESPONSE TO CLIMATE CHANGE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain what responses to climate change Bangladesh has taken so far
KEY POINTS		Response to climate change officially began when Bangladesh endorsed the Framework Convention on Climate Change in 1992 and became a Party to the Convention. As such, Bangladesh's participation and role in the inter-governmental process negotiating the global response to climate change and national responsibilities has been instrumental in guiding the national response process to some extent. Bangladesh is pursuing climate resilient development embracing adaptation as well as low carbon development as key strategies Further mainstream policy, institutions and processes for development are undergoing integration of climate risks and risk management options
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 5 Contents

MODULE 5

RESPONSE TO CLIMATE CHANGE

TRAINERS GUIDE

TOPICS DISCUSSED

Recognizing climate change impacts and vulnerability, nations and communities worldwide are taking response measures. Module 5 discusses key response measures taken so far, progress made in this regard, and future challenges, as a global collective and as one of the most vulnerable country.

MODULE CONTENTS

A. RESPONSE TO CLIMATE CHANGE

There are three main approaches currently practiced as response to climate change:

1. ***Mitigation*** Limit the cause of climate change through measures that could slow down the buildup of atmospheric GHGs concentrations by reducing current and future emissions and by increasing GHG sinks

Mitigation measures/strategies
Energy supply: Improved supply and distribution efficiency; fuel switching from coal to gas, combined cycle gas turbine (CCGT), nuclear power, renewable heat and power (hydropower, solar, wind, geothermal and bioenergy); combined heat and power, improved cooking stove; biogas.
Transport: More fuel efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shift from road transport to rail and water transport, shift from private to public transport systems; non-motorized transport (cycling, walking); land use and transport planning.
Buildings: Efficient lighting and day lighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves, improved insulation; passive and active solar design for heating and cooling; alternative refrigeration fluids, recovery and recycling of fluorinated gases; prudent use of air conditioner (AC).
Recycle: Generate as little trash as possible, because trash in landfill sites emits large quantities of methane, and if burned, carbon dioxide is released. Recycle cans, bottles, plastic bags and newspapers.
Communication: Use ICT facilities in work to reduce movement and visits that require less transport and thus less use of transport fuel, oils; e-learning, mobile/e-banking; electronic instead of paper based documentation.
Agriculture: Use of less chemicals (fertilizers, pesticides etc); use more organic fertilizers; use more manual labour; practice less/zero tillage; promote organic & integrated farming; introduce agro-forestry; afforestation for carbon sink; introduce less chemincal loving crop varieties.

2. ***Adaptation*** Increase the resilience and coping capacity of the sector with the current and future changes

Agriculture: Introduce tolerant/climate resilient crop varieties,adjustment of planning dates; crop rotation and copping pattern; improved/resilient technology/technical options; integrated farming; mixed cropping; improved land management, e.g. erosion control and soil protection through tree planting; off-farm livelihood options with value chain benefits.
Water: Expanded rainwater harvesting; water storage and conservation techniques; water re-use; desalination; water-use and irrigation efficiency.
Human health: Health action plans; emergency medical services; improved climate-sensitive disease surveillance and control; safe water and improved sanitation and latrines; health insurance.
Infrastructure/Settlement: Raise house plinth; raise the ground of institutions, community places; relocation; seawalls and storm surge barriers; dune reinforcement; land acquisition and creation of marshlands/wetlands as buffer against sea level rise and flooding; protection of existing natural barriers; establishing green belt or protection barriers.

Social protection: More social safety net programmes for the most vulnerable groups especially in the high risk areas; weather index based crop insurance programmes; livestock insurance schemes; life and health insurance.
Livelihoods: Diversify the livelihood with more off-farm, non-farm and climate proof/reslient options; focus on the most vulnerable and ethnic communities living in marginal land and high risk areas.

3. ***Institutional actions***

- Strengthen environmental awareness and action among your colleagues by initiating innovative and creative information and education campaigns.
- Encourage cooperation and partnerships among other institutions in programs and activities that would help fight global warming.
- Review your institution's current policies and programs that may work as either mitigation or adaptation strategies and measures in addressing climate change

B. GLOBAL RESPONSE TO CLIMATE CHANGE

Climate change is a complex problem, which, although environmental in nature, has consequences for all spheres of existence on our planet. It either impacts on-- or is impacted by-- global issues, including poverty, economic development, population growth, sustainable development and resource management. It is not surprising, then, that solutions come from all disciplines and fields of research and development.

At the very heart of the response to climate change, however, lies the need to reduce emissions. In 2010, governments agreed that emissions need to be reduced so that global temperature increases are limited to below 2 degrees Celsius.

In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable.

By 1995, countries realized that emission reductions provisions in the Convention were inadequate. They launched negotiations to strengthen the global response to climate change, and, two years later, adopted the Kyoto Protocol. The Kyoto Protocol legally binds developed countries to emission reduction targets. The Protocol's first commitment period started in 2008 and ended in 2012. The second commitment period began on 1 January 2013 and will end in 2020. The question of what happens beyond 2020 was addressed by Parties in Durban (2011).

There are now 195 Parties to the Convention and 192 Parties to the Kyoto Protocol. The UNFCCC secretariat supports all institutions involved in the international climate change negotiations, particularly the Conference of the Parties (COP), the Conference of the Parties serving as the meeting of the Parties (CMP), the subsidiary bodies (which advise the COP/CMP), and the COP/CMP Bureau (which deals mainly with procedural and organizational issues arising from the COP/CMP and also has technical functions). For a brief depiction of how these various bodies are related to one another, please see Bodies.

The timeline below identifies milestones in the international response to climate change so far:

2013 - At Warsaw, Key decisions adopted include decisions on further advancing the Durban Platform, the Green Climate Fund and Long-Term Finance, the Warsaw Framework for REDD Plus, the Warsaw International Mechanism for Loss and Damage, and other decisions

2012 - The Doha Amendment to the Kyoto Protocol is adopted by the CMP at CMP8.

2011 - The Durban Platform for Enhanced Action drafted and accepted by the COP, at COP17.
2010 - Cancun Agreements drafted and largely accepted by the COP, at COP16.
2009 - Copenhagen Accord drafted at COP15 in Copenhagen. Countries later submitted emissions reductions pledges or mitigation action pledges, all non-binding.
2007- IPCC's Fourth Assessment Report released. Climate science entered into popular consciousness. At COP13, Parties agreed on the Bali Road Map, which charted the way towards a post-2012 outcome in two work streams: the AWG-KP, and another under the Convention, known as the AWG-LCA.
2005 - Entry into force of the Kyoto Protocol. The first Meeting of the Parties to the Kyoto Protocol (MOP 1) takes place in Montreal. In accordance with Kyoto Protocol requirements, Parties launched negotiations on the next phase of the KP under the AWG KP.
What was to become the Nairobi Work Programme on Adaptation is accepted and agreed on.
2001 - Release of IPCC's Third Assessment Report Bonn Agreements adopted, based on the Buenos Aires Plan of Action of 1998.
Marrakesh Accords adopted at COP7, detailing rules for implementation of Kyoto Protocol, setting up new funding and planning instruments for adaptation, and establishing a technology transfer framework.
1997 - Kyoto Protocol formally adopted in December at COP3.
1996 - The UNFCCC Secretariat is set up to support action under the Convention.
1995 - The first Conference of the Parties (COP 1) takes place in Berlin.
1994 - UNFCCC enters into force.
1992 - The INC adopts UNFCCC text. At the Earth Summit in Rio, the UNFCCC is opened for signature
1991 - First meeting of the Intergovernmental Negotiating Committee (INC) takes place.
1990 - IPCC's first assessment report released.
IPCC and second World Climate Conference call for a global treaty on climate change.
United Nations General Assembly negotiations on a framework convention begin.
1988 - The Intergovernmental Panel on Climate Change is set up.
1979 - The first World Climate Conference (WCC) takes place.

International Response: Adaptation to Climate Change

The COP 13 in Bali, Indonesia (2007) launched a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, widely known as the Bali Action Plan. Unlike the Kyoto Protocol which heavily focuses on mitigation of GHG emissions, the Bali Action Plan gives equal weight to action on mitigation and adaptation, which are to be supported by finance and technology development and transfer, and achieved under an overarching shared vision for a long term cooperative action under the Convention.

The COP established the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), a negotiating body, to consider matters related to the Bali Action Plan. It initially was to complete its work and present an agreed outcome for adoption at COP 15 (2009) in Copenhagen, Denmark. As negotiations on the Bali Action Plan did not conclude at the COP 15, Parties decided to extend its mandate to present the outcome of its work at COP 16 (2010) in Cancun, Mexico (UNFCCC 2009).

The focus for the early phase of the intergovernmental negotiations under the Convention was largely on issues relating to the mitigation of GHGs. It was not until COP 7 (2001) that the consideration of adaptation to climate change made significant progress with the adoption of decision 5/CP.7 which sets

guidance for the implementation of Article 4, paragraphs 8 and 9 of the Convention. Decision 5/CP.7 became the cornerstone for much of the subsequent adaptation-related work under the Convention. It also outlines a number of activities to be supported by funding mechanisms under the Convention and the Kyoto Protocol, including those related to DRR such as supporting capacity building for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning in particular for droughts and floods in areas prone to extreme weather events; and strengthening existing and, where needed, establishing national and regional centers and information networks for rapid response to extreme weather events.

Decision 5/CP.7 further mandated the consideration of the implementation of insurance-related actions. Of particular importance to the LDCs, decision 5/CP.7 mandated action to enhance capacity of LDCs in dealing with climate change, including the preparation and implementation of national adaptation programs of action (NAPAs) (UNFCCC 2001).

Adaptation to climate change became the central issues at COP 10 (2004) in Buenos Aires, Argentina where Parties, taking into account the outcomes of the activities under decision 5/CP.7, adopted decision 1/CP.10: the Buenos Aires program of work on adaptation and response measures. Under decision 1/CP.10, Parties also agreed to develop a structured five-year program of work on the scientific, technical and socio-economic aspects of impacts, vulnerability and adaptation to climate change, to address the issues of methodologies, data and modeling; vulnerability assessments; adaptation planning, measures and actions; and the integration into sustainable development (UNFCCC 2004). The initial sets of activities were agreed at COP 12 (2006) in Nairobi, Kenya where it was renamed the "Nairobi work program on impacts, vulnerability and adaptation to climate change".

A comprehensive adaptation framework/programme is being considered under the Bali Action Plan to be part of a future climate regime is envisaged to include provisions to integrate adaptation into national and sectoral planning processes, to develop knowledge, information and capacity for implementing concrete adaptation actions, to enhance adaptation technologies, to mobilize the cooperation of relevant organizations, and to monitor and evaluate the support for adaptation action.

C. BANGLADESH'S RESPONSE TO CLIMATE CHANGE

Bangladesh is a climatic hazard prone country with a history of catastrophic cyclone and flood events resulting in significant losses of lives and damages to property. The geographical location, physical features and elevation level makes Bangladesh vulnerable to flood and cyclone. At the same time, the majority of people depend on natural resources for livelihood and sustenance. Experience over generations has passed on some capacity among people to cope with the hazards and their devastation. However, chronic poverty among a significant part of the population as well as limited resources both add to their vulnerability context.

In the past few decades, global warming induced climate change impacts have been observed in the country. These are early signs of what is to come in the coming decades. People, mostly those poor and marginalized, are suffering first and most. Development goals and targets are undermined, in key sectors like agriculture and food and livelihood security. Infrastructure and settlement are destroyed or damaged. Ecosystems are degraded to an extent where water logging or salinity levels in soil and water is pushing families and communities to out migrate to urban centers. A small section of the environment research and advocacy community, spearheaded by conscious and inspired scientists, environment and development activists have been engaged with international community and counterparts in promoting

awareness and understanding of Bangladesh's vulnerability and demands for a common future, based on equity and differentiated responsibility and capabilities.

For Bangladesh, response to climate change, at global level as well as nationally and locally is a matter of grave concern - for today, and more for tomorrow's generations. At the global level, climate change mitigation or reducing greenhouse gases (GHGs) must engage all countries, particularly the large emitters, start as early as possible, reduce as much as possible, if we are to avoid irreversible global warming with unmanageable consequences of resulting climate change.
On the other hand, the accumulated carbon concentration levels in the atmosphere will sustain for centuries, and even without any addition of GHG, has already triggered into motion a change in the climatic process. Thus, Bangladesh will confront the impacts of climate change and its effects well into the future. To respond effectively, the country and its population must reduce vulnerability, increase adaptive capacity to continue on a sustainable development pathway. We need to manage the unavoidable impacts and consequences.

As a flood and cyclone prone country, Bangladesh has a well established institution to serve both emergency response as well as disaster risk reduction needs for its vulnerable communities and investments. This experience and institutional capability will provide a strong foundation to establish climate risk management and adaptation activities.

Response to climate change officially began when Bangladesh endorsed the Framework Convention on Climate Change in 1992 and became a Party to the Convention. As such, Bangladesh's participation and role in the inter-governmental process negotiating the global response to climate change and national responsibilities has been instrumental in guiding the national response process to some extent.

One of the first actions was preparing the Initial National Communications (2002) and submitting with UNFCCC, fulfilling a voluntary obligation. The First Assessment Report of IPCC also provided stimulus among researchers and scientists. Initial studies compiling and synthesizing research findings from different field of disciplines also contributed to develop a basic understanding on Bangladesh's vulnerability to impacts of climate change. The second national communication was prepared and submitted to UNFCCC in 2012. During 1992-2000, most of the national response was in improving scientific understanding among mainstream actors and key institutions, and to participate in UNFCCC process and lay its stake in a group with LDC countries. In 2001, following Marrakech Accord, global attention on Adaptation geared up, paving way for these countries to prepare national adaptation programmes of action (NAPA) considering prioritized needs. Bangladesh NAPA was submitted in 2005, (and subsequently updated in 2010), opening up opportunities for planned adaptation to development. A number of NAPA projects have already been initiated, financed from the LDC Fund under UNFCCC.

The country also has assessed its national capacity to respond to climate change (National Capacity Self Assessment). One of the pioneering community based adaptation initiatives, Reducing Vulnerability to Climate Change was piloted by Care Bangladesh and local partner NGOs and funded by CIDA during 2002-2004 in six districts in south-west Bangladesh. The process and results from this initiative provided much inspiration among development partners, INGOs and local actors resulting in a number of Community Based Adaptation (CBA) pilot projects.

In 2004, a Climate Change Cell at DoE was established to support and service the emerging responsibilities of MoEF and DoE to build necessary understanding, institutional structure, mechanisms and processes to respond effectively. During 2004-2009, a range of activities were initiated to stimulate and motivate relevant actors to engage effectively in national response measures. These included awareness and learning materials

and events, commissioned research, capacity strengthening, stakeholder consultation and network, etc. At the same time, with the Hyogo Framework for Action (2005-2015) coming into force, the disaster management community also began understanding about relationship between disaster and climate risks, identifying synergies and complementarities.

The comprehensive disaster management framework of the country, following HFA concerns of climate change impacts on disaster risks (climate induced hazards and phenomena), also initiated response integrating disaster risk reduction with adaptation to climate change, specially at the local and community levels. Methods, tools and techniques to enable capacity and facilitate DRR has been reviewed incorporating climate change concerns. The CRA-RRAP approach demonstrated and mainstreamed by CDMP, followed by a (LDRRF) mechanism to finance some of the adaptation activities at community level identified provides opportunity to explore practical and effective ways to implement response to climate change (adaptation) on the ground.

Climate projection and modelling activities have taken root as early as mid 1990's. UK Met Office, Hadley Center and BUET (which established its own climate change cell in 2008) collaborates to strengthen In-country capacity to utilize climate models (PRECIS) to produce reliable climate change predictions (scenario) as well as climate change impacts prediction still remains inadequate.

Sector level response began with impacts, vulnerability and adaptation needs assessments, mainly in water resource, agriculture, and forestry. UKAID and DANIDA has led climate screening exercises in these sectors, where currently initiatives are planned or underway on the basis of the screening.

Since 2009, the country has geared up its response to climate change. Significant development was preparing the Bangladesh Climate Change Strategy and Action Plan (BCCSAP). This Action Plan currently provides the basis for identifying response to climate change (adaptation and mitigation) for all actors, sectors and processes. Various funding mechanism was also established, which is described under module six.

Response to climate change is undergoing integration within mainstream planning and development processes. The Vision 2021, Five Year Plans, National Sustainable Development Strategy (NSDS) all has considered climate change as a major concern for development and well-being, and identify response measures for uptake and action by concerned actors and agencies. The planning process of the country is addressing the poverty-environment-climate management nexus building on a recent initiative (PECM). Also, efforts to make the budgetary processes more climate smart, as well as to climate proof development projects is underway.

The government also has established climate change cells in most of the concerned Ministries and also a Climate Change Unit to serve as Secretariat for Climate Change Response Management by MoEF. Also, focal points on climate change are identified who are expected to facilitate climate change mainstreaming activities and processes in their sector, ministry, department, agency, operational levels, etc.

To sum up, Bangladesh is at a start of a very long journey in confronting climate change and adapting to the impacts. Pragmatic reasoning, committed political leadership, knowledge based society, systematic approach, cooperation and collaboration, meaningful and effective participation, good governance, etc. will be preconditions for nurturing and culturing capacity to effectively respond to climate change concerns.

The national response to climate change is further discussed, focusing on the following areas: (a) the policy formulation process; (b) the policy dissemination, implementation, and monitoring/tracking mechanisms; (c) the gender dimensions in climate change policies; and (d) the institutional arrangements and capacity for climate change programming.

SUGGESTED READING

Ministry of Environment and Forests; 2009; Bangladesh Climate Change Strategy and Action Plan 2009; Government of the People's Republic of Bangladesh. Available online at:

Ministry of Environment and Forests; 2012; Second National Communications of Bangladesh to the United Nations Framework Convention on Climate Change; Government of the People's Republic of Bangladesh. Available online at:

GoB; 2009; Policy Study on The Probable Impacts of Climate Change on Poverty and Economic Growth and the Options of Coping with Adverse Effect of Climate Change in Bangladesh; Support to Monitoring PRS and MDGs in Bangladesh; General Economics Division, Planning Commission, Government of the People's Republic of Bangladesh & UNDP Bangladesh.

MODULE 6

POLICIES AND INSTITUTIONS FOR CLIMATE CHANGE

MODULE 6

POLICIES AND INSTITUTIONS FOR CLIMATE CHANGE

OVERVIEW OF MODULE

DURATION		Training Course: 90 minutes
DURATION		At the end of the Module 6, the participants will learn and be able to explain climate change related policies in Bangladesh, the institutional arrangements to support response to climate change; and the different types and sources of financing adaptation available in the country.
COVERAGE		The Session covers the following topics: Climate Change Related Policies Institutional Arrangements for Climate Change Adaptation Funding Mechanisms
SUGGESTED METHOD		Presentation and discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. CLIMATE CHANGE RELATED POLICIES

DURATION		Training Course: 30 minutes
DURATION		At the end of the session, participants will be able to explain the climate change related policies in Bangladesh
KEY POINTS		In the absence of an overarching policy on climate change, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is the de facto policy document that provides strategic direction for work on climate change related issues. There may be needed for a guiding policy on climate change and for specific guidelines for designing and implementing the programs listed in BCCSAP The Sixth Five Year Plan (2011-2015) of the country has integrated climate change as a cross-cutting concern similar to governance and gender Other Sector Policies are also undergoing review to identify and integrate climate change responses
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 6 Contents

B. INSTITUTIONAL ARRANGEMENTS FOR CLIMATE CHANGE

DURATION		Training Course: 30 minutes

DURATION		At the end of the session, participants will be able to explain the current institutional arrangement in Bangladesh for response to climate change

KEY POINTS		in the early 1990s, the Government of Bangladesh formed an inter-ministerial steering committee and a technical advisory committee on climate change. The committee consisted of representatives of the GoB from various ministries along with civil society representatives. Ministry of Environment and Forest (MoEF) Established by the government after Bangladesh signed and ratified the UNFCCC, the Ministry of Environment and Forest is the lead institution mandated to work on climate change issues. Nationally, MoEF is the appointed institution to lead the implementation of climate change programming under the BCCSAP. MoEF has become active in mobilizing funds and instituting mechanisms for managing climate change funds. In 2010-2011, MoEF formed a Climate Change Unit (CCU) to provide support to the Bangladesh Climate Change Trust Fund (BCCTF). Inter-ministerial coordination, the role of local government and the National Parliament are also areas of potential.

SUGGESTED METHOD		Presentation and Discussion

RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 6 Contents

C. ADAPTATION FUNDING MECHANISMS

DURATION		Training Course: 30 minutes
DURATION		At the end of the session, participants will be able to explain the adaptation financing mechanisms currently in place in the Country
KEY POINTS		Three large funding windows currently offer financial resources to advance climate change related activities. These are: (a) The Bangladesh Climate Change Trust Fund (BCCTF) - a fund created with budgetary allocation from Bangladesh's revenue sources (b) The Bangladesh Climate Change Resilience Fund (BCCRF) - a fund created as a Multi-Donor Trust Fund (MDTF) to draw bilateral and multilateral donations from development partners. This fund is currently administered by the World Bank with a further provision for Palli Karma Sahayak Foundation (PKSF) to operate the NGO financing window of the BCCRF (the NGO-funding mechanism accounts for 10 percent of the total fund) (c) The Pilot Program for Climate Resilience (PPCR) funding opportunities created by the World Bank under the Climate Investment Funds (CIFs)
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 6 Contents

MODULE 6

POLICIES AND INSTITUTIONS FOR CLIMATE CHANGE

TRAINERS GUIDE

A. CLIMATE CHANGE RELATED POLICIES

TOPICS DISCUSSED

1) Climate Change Related Policies
2) Institutional Arrangements for Climate Change
3) Adaptation Funding Mechanisms

MODULE CONTENTS

1. CLIMATE CHANGE AND RELATED POLICIES

In the absence of an overarching policy on climate change, the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is the de facto policy document that provides strategic direction for work on climate change related issues. There may be needed for a guiding policy on climate change and for specific guidelines for designing and implementing the programs listed in BCCSAP.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP): Bangladesh was one of the first countries to develop a climate change strategy and action plan. The program areas identified in the BCCSAP includes both climate change adaptation and disaster preparedness.

The BCCSAP has identified six thematic areas and corresponding programs related to key sectors, including: agriculture and food security; human well being; water resources; disaster risk management; and infrastructure (MoEF, 2009). The BCCSAP also attaches importance to Low-Carbon Development while emphasizing the principle of "common but differentiated responsibility" outlined in the UN Framework Convention on Climate Change (UNFCCC), a demand made by many developing countries. In addition, the strategy outlines programmatic approaches such as institutional strengthening, human resource development, and research and knowledge management. The BCCSAP has identified 44 programs under the six thematic areas, and specifies institutions responsible for implementing these programs, including the government, civil society organizations, and the private sector. With a total timeframe of 10 years (2009-2019), the implementation of this plan has been divided into four distinct phases.

The Six thematic areas identified in BCCSAP are

- Food Security, Social Protection, and Health: The area relates to ensuring food and livelihood security, especially for the poorest and most vulnerable in society, including women and children. It focuses on the needs of this group for food security, safe housing, employment, and access to basic services, including health.
- Comprehensive Disaster Management: This is to further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.
- Infrastructure: This Action Plan is to ensure that existing assets (e.g. coastal and river embankments) are well-maintained and fit-for-purpose, and that urgently needed infrastructure (e.g. cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.
- Research and Knowledge Management: This is to predict the likely scale and timing of climate change

impacts on different sectors of the economy and socioeconomic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on science, and best practices of climate change management.

- Mitigation and Low Carbon Development: This is to evolve low carbon development options and implement these as the country's economy grows over the coming decades and the demand for energy increases.
- Capacity Building and Institutional Strengthening: This is to enhance the capacity of government ministries and agencies, civil society, and the private sector to meet the challenge of climate change and mainstream them as part of development actions.

Sixth Five Year Plan (SFYP) A major step forward in the Government of Bangladesh's plans to address the potential impact of climate change is demonstrated through Bangladesh's Sixth Five-Year Plan (2011-2015). Unlike previous plans, the Sixth Five-Year Plan (2011-2015) pays significant attention to climate change issues and dedicates an entire chapter to adaptation and mitigation strategies for addressing climate change, "Chapter 8: Environment, Climate Change, and Disaster Management for Sustainable Development." It also identifies specific programs in line with the themes in BCCSAP, sets benchmarks for achieving programmatic goals, and outlines implementation strategies.

Other Sectoral Policies: Some elements of climate change adaptation are addressed through specific sectoral policies (Ahmed, 2004; UO-Oxfam, 2008; Rahman, et al., 2010). However, with the exception of the Coastal Zone Policy (MoWR, 2004), and the recently renewed National Agriculture Policy (MoA, 2011), climate change issues have not been sufficiently highlighted in the national policy regime. Given the importance of climate change and its potential adverse implications on economic development and people's lives and livelihoods, revision of sectoral policies and explicit inclusion of climate change impacts and considerations in these policies are priorities.

2. INSTITUTIONAL ARRANGEMENTS FOR CLIMATE CHANGE

When the international discourse on climate change began over two decades ago, the Bangladesh Meteorological Department (BMD) was the primary institution focusing on issues related to the work of the IPCC in the early 1990s. Around the same period, the Government of Bangladesh formed an inter-ministerial steering committee and a technical advisory committee on climate change. The committees consisted of representatives of the GoB from various ministries along with civil society representatives.

Since 2004, the Department of Environment (DoE) and its Climate Change Cell (CCC) apart from serving Ministry of Environment and Forest (MoEF) served as the technical support unit for the Ministry of Disaster Management and Relief (MoDMR) under their Comprehensive Disaster Management Program (CDMP). DoE under MoEF coordinated climate change research, designed and coordinated to finalize Bangladesh's National Adaptation Program of Action (NAPA) in 2002-2005, and represented Bangladesh in United Nations Framework Convention on Climate Change (UNFCCC) negotiation related meetings and events. At present, institutional arrangements for climate change programming are divided primarily among the Ministry of Environment and Forest, coordination among government ministries, the Bangladesh Parliament, and local government.

Ministry of Environment and Forest (MoEF) Established by the government in 1989 along with the Department of Environment. Ministry of Environment and Forest is the lead Ministry mandated to work on climate change issues. The Ministry led the Initial National Communication (INCom) to the UNFCCC, the BCCSAP, and preparation of the Second National Communication (SNC) to the UNFCCC (MoEF, 2002; MoEF-UNDP, 2005).

MoEF directs all climate change related policy issues and represents the country at international negotiations under the UNFCCC, a number of UNFCCC committees, and at conferences on multinational environmental agreements. The chief international negotiator on climate change for Bangladesh is from MoEF.

Nationally, MoEF is the appointed institution to lead the implementation of climate change programming under the BCCSAP. The Minister for Environment and Forest generally responds to the queries on Bangladesh's preparation and response to climate change in the national parliament. In early 2012, the lead position for MoEF was upgraded from a state minister to a full minister. This change recognized the importance of the Ministry and the climate change portfolio, and was a step that sought to enhance the clout and negotiation capacity of the Ministry among other ministries. The MoEF also chairs the Local Consultative Group (LCG) on Climate Change and Environment, which is an apex coordination mechanism between the government and development partners on environment and climate change programs.

With the advent of international financing modalities on climate change and the availability of seed financing for three consecutive years from the government, MoEF has become active in mobilizing funds and instituting mechanisms for managing climate change funds. During 2010-2011, MoEF formed a Climate Change Unit (CCU) to provide support to the Bangladesh Climate Change Trust Fund (BCCTF). The CCU has now been transformed into Climate Change Trust (CCT).

There are also discussions on forming a separate department under MoEF to manage issues related to climate change. Prior to the formation of the CCU within the MoEF, the CCC in DoE used to maintain the information on climate change initiatives.

Inter-Ministerial Coordination: Although the strategic institutional framework for how government ministries are required to interact on climate change issues is not clearly articulated in the BCCSAP, the BCCSAP envisions climate change programming to function within a "multi-institutional architecture." National institutions, which predominantly represent the interests of public sector institutions and their allied agencies (such as Trustee agencies formed under a certain ministry), are mandated to implement the BCCSAP 44-point agenda. NGOs are expected to have a role in some program implementation and capacity building, as described in the document. However, institutional linkages between various ministries, their allied departments, and national and local government institutions are not clearly articulated in the BCCSAP.

BCCSAP seeks collaboration with a number of actors from government, institutions, and the public sector to implement the 44-point agenda. During DoE's tenure, the presently defunct CCC initiated a process to identify an institutional focal point in each ministry/agency and to provide them with a basic training on climate change issues. In addition to facilitating inter-ministerial coordination through these focal points, the MoEF embarked on a project called "Poverty, Environment and Climate Mainstreaming", in which the Ministry of Planning screens various investment projects submitted to the Annual Development Plan (ADP) in their design phase so that coordination with any relevant focal point may be fostered during the planning stage. Once operational, this mechanism is expected to ensure the integration of climate change into the design and planning of all projects under ADP.

Additionally, the Ministry of Planning has taken concrete steps toward integrating climate change issues into the ADP process.

The Role of Local Government: Local government institutions (LGIs), such as Union Parishads (UPs) and

municipalities, are entities that operate at the local level and therefore have a direct understanding of the needs of people in their communities. Elected through direct votes from the local population, the representatives live in the respective constituencies and act as the fi rst point of contact for most of the issues affecting the community members' lives and livelihoods. In addition, there are several standing committees within the local government that are related to climate change, e.g., disaster management, health, education, agriculture, etc.

As with most development interventions, LGIs have been partnering with NGOs and donors to implement climate change initiatives. The Reducing Vulnerability to Climate Change (RVCC) Project (2002 - 2005) had a component called "Integration of Adaptation in Local Planning." It enabled 14 UPs in the southwest of the country to incorporate disaster risk management into their local development plans. The project was tested under the first phase of the Comprehensive Disaster Management Programme (CDMP), a national program on disaster risk reduction, and has since been scaled-up and implemented in about 630 UPs in selected districts. In the second phase of the CDMP, all the remaining UPs will gradually be brought under its coverage to implement climate change adaptation. It is therefore expected that all LGIs will be able to play a key role in climate change adaptation. Much, however, depends on how they engage in both public and private partnerships to build their technical capacity and how they are able to continue to finance programs. in recent years there has been an emerging paradigm shift taking self governing power from LGIs to a more centralized system through the engagement of the MPs in local development interventions.

The Bangladesh Parliament: In the milieu of institutional arrangements on climate change, the parliamentarians have the potential to exert significant influence on institutional processes. An All Party Parliamentary Group (APPG) on environment and climate change was formed in 2009. It has taken initiatives to provide orientation training to about 140 Members of Parliament (MPs) on climate change issues and their roles. The committee has been vocal within the national parliament on climate change issues.

3. ADAPTATION FINANCING MECHANISMS

Climate change adaptation financing in Bangladesh comes through national, bilateral and multilateral sources. Until 2009, most of the climate change financing was offered through small bilateral or UN-sponsored grant programs. The majority of such funds helped raise awareness about the threats of climate change and promote small-scale, community-based adaptation initiatives. However, institutionalization of climate change adaptation could not be initiated with such limited funding.

Major Funds for Climate Change Programming Three large funding windows currently offer financial resources to advance climate change related activities. These are:

(a) The Bangladesh Climate Change Trust Fund (BCCTF) - a fund created with budgetary allocation from Bangladesh's revenue sources
(b) The Bangladesh Climate Change Resilience Fund (BCCRF) - a fund created as a Multi-Donor Trust Fund (MDTF) to draw bilateral and multilateral donations from development partners. This fund is currently administered by the World Bank with a further provision for Palli Karma Sahayak Foundation (PKSF) to operate the NGO financing window of the BCCRF (the NGO-funding mechanism accounts for 10 percent of the total fund)
(c) The Pilot Program for Climate Resilience (PPCR) funding opportunities created by the World Bank under the Climate Investment Funds (CIFs) Bangladesh Climate Change Trust Fund (BCCTF)

Bangladesh Climate Change Trust Fund (BCCTF)

Ministry of Environment and Forests is assigned by BCCSAP 2009 to look after and take actions regarding climate change. Based on a Cabinet decision, BCCTF and its Trustee Board were established in 2010 as the first step towards the implementation of BCCSAP (BCCT, 2014). To provide secretarial support to BCCTF a Climate Change Unit was established under the Ministry of Environment and Forests. Later through BCCT Regulation 2013 the Climate Change Unit was given a formal organizational shape known as Bangladesh Climate Change Trust.

BCCTF is a block budgetary allocation in the form of an endowment by the Government. It has been established with the revenue budget to support implementation of BCCSAP 2009. Since 2009-10 up to 2013-14 fiscal year, a total of BDT 2700 crore taka has been allocated to BCCTF.

Table 6.1 BCCTF Budgetary Allocation

Serial	Fiscal Year	Allocated Amount (in crore taka)
1.	2009-2010	700.00
2.	2010-2011	700.00
3.	2011-2012	700.00
4.	2012-2013	400.00
5.	2013-2014	200.00
	Total	**2700.00**

As per Climate Change Trust Act, 2010, a maximum of 66% of the allocated amount as well as the interests accrued on the remaining 34% kept as fixed deposit can be allocated to CCTF projects.

As of April 2013, 282 projects have been undertaken with an estimated cost of 1997.04 crore taka. Different Ministries, departments and agencies of the Government are implementing 219 projects while 63 projects are being implemented by NGOs. Among the Government projects, 31 have already been completed. The financial management of NGO projects has been vested to Palli Karma-Sahayak Foundation (PKSF). So far, 25 crore taka has been allocated to PKSF. Additional information on Bangladesh Climate Change Trust can be accessed from www.moef.gov.bd.

Bangladesh Climate Change Resilience Fund (BCCRF)

The fund was established in May 2010 with financial support from Denmark, European Union, Sweden and United Kingdom. Switzerland, Australia and United States subsequently joined the fund. This mechanism enabled the government to channel over US$188 million grant funds to millions of Bangladeshis to build their resilience to the effects of climate change. The Bangladesh Government leads on the management and implementation of BCCRF, while World Bank administers the fund for at least initial three years. Additional information on Bangladesh Climate Change Trust can be accessed from www.moef.gov.bd.

In concurrence with the MoEF, an autonomous body Palli Karma Sahayak Foundation- which is specialized in administering micro-credit programs involving disbursement to NGOs - has been entrusted to administer small-scale funds for NGOs.

Pilot Program for Climate Resilience

Under the Pilot Program for Climate Resilience (PPCR), implemented by the World Bank under the Climate Investment Funds, Bangladesh has been offered a total of US$110 million, of which $50 million will be provided as a loan, and the remaining amount as a grant (Equity BD, 2010). A number of CSOs

have been campaigning against the loan component of the PPCR as there are concerns about whether Least Developed Countries such as Bangladesh should have to pay back funds for a problem they were primarily not responsible for (climate change), and because this negates the idea that climate change funding should be in addition to traditional foreign aid funds. As of this writing, it remained uncertain whether the GoB will accept the terms of the concessionary loan from the World Bank (Hedger, 2011).

Role of development partners and international financing institutions

Some early financing by the Commonwealth Centre, the Dutch Ministry for Public Works, the Asian Development Bank (ADB), and the Ford Foundation contributed significantly to developing the initial knowledge-base on specific vulnerabilities to climate change (Mahtab, 1989; ADB, 1994, BCAS-RAApprotech, 1994; BUP-CEARS-UEA, 1994). Following these initial studies, more in-depth studies were conducted with grants from the United States Agency for International Development (USAID), the Global Environment Facility (GEF) (through the ADB), and the World Bank (Ahmed et al., 1996; Huq et al., 1996; Karim, 1996; Huq et al., 1998, ADB, 1998; WB, 2000).

The United Nations Development Programme (UNDP) provided support to the GoB for preparing the Initial National Communication - INCom (MoEF, 2000) and NAPA (MoEF-UNDP, 2005) to the UNFCCC. Both UNDP and DFID have been supporting costs for participation of Bangladeshi delegates in international negotiations. The Canadian International Development Agency (CIDA) provided finance through the Canadian Climate Change Fund to carry out a pilot project for reducing vulnerability to climate change (i.e. RVCC), which in turn provided valuable lessons for other community based adaptation work across the globe (Ahmed, 2010).

ADB and World Bank financing has primarily focused on providing technical assistance to adaptation work and enhancing the federal government's capacity to respond to the policy and implementation needs on climate change respectively. The ADB has initiated a technical assistance project to enhance the capacity of Ministerial Focal Points. One component of World Bank-managed PPCR is to enhance the capacity of public institutions through training on climate change.

Donors and a few civil society representatives participate in the Local Consultative Group (LCG) on Climate Change and Environment, chaired by MoEF, to ensure better coordination of efforts between the government, donors, and CSOs. Two CSO representatives, the International Union for Conservation of Nature (IUCN), and PKSF, are included in this group. The group has put together a matrix with basic information on the programs that various donors are supporting in Bangladesh.

SUGGESTED READING

Christensen, Kevan, Sajid Raihan, Rubayat Ahsan, A M Nasir Uddin, Chowdhury Saleh Ahmed, and Helena Wright.; 2012; Financing Local Adaptation: Ensuring Access for the Climate Vulnerable in Bangladesh. Dhaka: ActionAid Bangladesh, Action Research for Community Adaptation in Bangladesh, Bangladesh Centre for Advanced Studies, and International Centre for Climate Change and Development.

S M Munjurul Hannan Khan, Saleemul Huq and Md Shamsuddoha; The Bangladesh National Climate Funds: A brief history and description of the Bangladesh Climate Change Trust Fund and the Bangladesh Climate Change Resilience Fund; LDC papers Series; ECBI IIED; Available online at:

Ministry of Environment and Forests; 2009; Bangladesh Climate Change Strategy and Action Plan 2009; Government of the People's Republic of Bangladesh. Available online at:

Ministry of Environment and Forests; 2012; Second National Communications of Bangladesh to the United Nations Framework Convention on Climate Change; Government of the People's Republic of Bangladesh. Available online at:

MODULE 7

ADAPTATION TO CLIMATE CHANGE

ADAPTATION TO CLIMATE CHANGE

MODULE 7

OVERVIEW OF MODULE

DURATION		Training Course: 180 minutes
OBJECTIVES		At the end of the Module 7, the participants will learn and be able to explain 1. Adaptation: concept, approaches 2. Adaptation: a development imperative 3. Adaptation and reducing disaster risks 4. Examples of adapting to climate change 5. Adaptation with mitigation opportunities
COVERAGE		A. Adaptation: concept, types and approaches B. Why adaptation must be considered as development imperative to manage unavoidable consequences of climate impacts C. Adapting to climate change and reducing disaster risks both addresses vulnerability and resilience D. Adaptation can mean sharing losses, modifying threats, prevent impacts, change use, research, change behavior and rules, etc. E. Adaptation actions may have consequences for mitigation. mitigation actions may have consequences for adaptation. Decisions may include trade-offs or synergies between adaptation and mitigation, Processes may have consequences for both adaptation and mitigation.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. ADAPTATION: CONCEPT, APPROACHES

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the key concepts and approaches to adaptation.
KEY POINTS		Adaptation to climate change: Adjustments in human and natural systems in response to actual or expected climate stimuli or their impacts that moderate harm or exploit beneficial opportunities Adaptive capacity: The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences Adaptation to climate change could mean sharing losses, modifying threats, prevent impacts, change use, change location, change behaviour and rules, research, etc. Adaptation opportunities are to be identified in policy, infrastructure, capacity development, research and good practices. Everyone from international communities of practice, national government, private sector, NGOs and the public must act.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 7 Contents

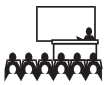
B. ADAPTATION: A DEVELOPMENT IMPERATIVE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the linkages between development and climate change
KEY POINTS		Climate change affects the livelihoods of people, resulting in a need for adaptation in key development sectors. There is thus a direct link between adaptation and development. For maximum effectiveness, adaptation should be integrated into development planning and decisions. Features of practical adaptation include making use of climate information, applying a cost-benefit rationale, broadening climate risk management, improving coordination and communication among involved stakeholders, making use of good practices and innovations.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 7 Contents

C. ADAPTATION AND REDUCING DISASTER RISKS

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session participants will be able to explain the linkages between adaptation to climate change and disaster risk reduction
KEY POINTS		Disasters and Climate Change are both development risks. There is a clear urgency to recognize the growing threat from these risks on achieving our national vision, goals and targets for sustainable development in the decades ahead, and take necessary measures to address and manage these development risks in the mainstream processes. Disaster Risk Reduction (DRR) is the development and application of policies and practices that minimizes risks to vulnerabilities and disasters, applies to managing/responding to current disaster risks. Climate Change Adaptation (CCA) is an adjustment in natural and human systems, which occurs in response to actual or expected climate changes or their effects. In human systems, adaptation can reduce harm or utilize opportunities. Both DRR and CCA address reducing risks of present development efforts, of past gains, and future aspirations. However, points to note are: • All disasters (natural, human-induced) are not linked to climate. Examples are earthquake and tsunami, volcanic eruption, etc. which are "geological". • All adaptation needs and actions may not require consideration of disaster risks, as they may provide "benefit" rather than "harm" development society and national pursuits. Important point is that both DRR and CCA considerations are necessary in today's world, and more specially in the case of Bangladesh, from planning through delivery of development goals and targets.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 7 Contents

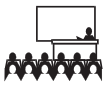
D. EXAMPLES OF ADAPTING TO CLIMATE CHANGE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain some examples of adapting to climate change.
KEY POINTS		Adaptation measures can vary in their timing (anticipatory vs. reactive; ex ante vs. ex post), scope (short-term vs. long-term; localized vs. regional), purposefulness (autonomous vs. planned; passive vs. active) and adapting agent (private vs. public; societies vs. natural systems). We may classify adaptation along a continuum of activities ranging from "pure" development activities with a vulnerability focus to measures with an explicit focus on climate change impacts. Four categories of adaptation along this continuum can be identified: a) activities that are fundamentally about increasing human development and thus address drivers of vulnerability. b) activities that focus on building response capacity c) activities aimed at managing climate risk d) activities with the objective of confronting climate change, and thus focuses almost exclusively on addressing climate change impacts
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 7 Contents

E. ADAPTATION WITH MITIGATION OPPORTUNITIES

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the adaptation actions which also create opportunities for mitigation to climate change
KEY POINTS		Four types of inter-relationships between adaptation and mitigation have been identified (IPCC). These are • Adaptation actions that have consequences for mitigation, • Mitigation actions that have consequences for adaptation, • Decisions that include trade-offs or synergies between adaptation and mitigation, • Processes that have consequences for both adaptation and mitigation.
SUGGESTED METHOD		Presentation and Discussion Conduct Exercise using template provided Encourage Participants reflection on the exercise
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 7 Contents

F. USING NFORMATION TO PLAN ADAPTATION (Optional)

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the need and use of information to plan adaptation measures
KEY POINTS		Assessment of climate change risk and vulnerability require credible information on existing climate and its trend, and the possible future climate and its variability. The information on future climate and its variability is usually obtained from general circulation models and regional climate model projection. However, the information on existing climate and its trend is derived either from the analysis of the observed historical data or from the community perception and experience. The former being instrumental in nature is more reliable than the latter. Such information on base climate and its trend when conveyed to the community people, risk analysts, and policy and decision makers help better assess the level of community risk and devise better mitigation and adaptation strategies and plans. Such information can also be useful in checking the reliability of climate model projections.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations Module 7 Contents

MODULE 7

ADAPTATION TO CLIMATE CHANGE

TRAINERS GUIDE

TOPICS FOR DISCUSSION

Managing the consequences of unavoidable climate change impacts involves reducing vulnerability, and increasing adaptive capacity. Module 7 discusses concepts and approaches to adaptation to climate change, that adaptation to climate change is a development imperative, not an option. Also, relationship between adaptation and reducing disaster risks is highlighted. Examples of adaptation in different development sectors are shared, including opportunities linking with mitigation actions and generation and use of climate information to plan adaptation actions.

MODULE CONTENTS

A. ADAPTATION TO CLIMATE CHANGE - CONCEPT, APPROACHES

Adaptation is needed to prepare communities, regions, countries and societies for the consequences of climate change. Practically, adaptation to climate change means doing things differently because of climate change (UNDP 2004).

Most often, it does not mean doing completely new things, but rather purposefully modifying development interventions. Adaptation itself is not a development objective, but necessary for safeguarding beneficial outcomes. Adaptation measures may be compared with a baseline of 'doing nothing', resulting in bearing losses and not making use of opportunities. Bearing losses occurs particularly when those affected have no capacity to respond in any other way (for example in extremely poor communities) or where the costs of adaptation measures are considered to be high relative to the risk or expected damage.

Adaptation to climate change: Adjustments in human and natural systems in response to actual or expected climate stimuli or their impacts that moderate harm or exploit beneficial opportunities (IPCC 2007e)

Adaptive capacity: The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences (IPCC 2001)

Adaptation can mean one or a number of the following:

Table 7.1 Types of Adaptation

Strategy	Example
Share losses	Support from extended family, insurance, or social programmes
Modify threat	Change in the management of dykes and dams to modify flood patterns
Prevent impacts	Redistribution of water to avoid scarcity
Change use	Change crops or soil management
Change location	Relocation of settlements or economic activities
Research	Improve seed research
Change behaviour and rules	Rainwater harvesting; conservation
(Source: OECD 2009)	

To a certain extent, adaptation happens every day as we adjust to changes around us. This is called autonomous adaptation. However, to make use of adaptation opportunities in different sectors, capacities need to be developed at different levels and policies need to be adjusted. The chart modified from the World Resources Institute (WRI) shown on the following page describes categories of activities along a continuum of adaptation and development ranging from a 'development focus' to an 'impact focus'.

It includes:
1) activities that increase human development and address drivers of vulnerability, e.g. diversification of livelihoods;
2) activities that reduce climate risks in affected sectors, e.g. reforestation and other measures related to natural resource management;
3) activities that aim at building response capacities through training, strategic use of climate information and its integration into planning, eg. monitoring water quality or disaster risk management;
4) activities that confront climate change by addressing concrete impacts, e.g. managing coral reefs in response to bleaching.

Adaptation opportunities

- Policy
- Infrastructure
- Capacity development
- Research
- Good practices

Who acts and how

- Government: Responsibilities are setting rules and regulations for public assets, public services, public goods, social protections, preventing conflict and managing migration
- Individuals: Focus on household preparedness, autonomous adaptation
- Private sector: Task is to integrate climate risks into project design and services (climate-resilient investments)
- International cooperation: Is required to have financial responsibility, resilient ODA, capacity development

B. LINKING ADAPTATION TO DEVELOPMENT

Key messages

- Climate change affects the livelihoods of people, resulting in a need for adaptation in key development sectors. There is thus a direct link between adaptation and development.
- For maximum effectiveness, adaptation should be integrated into development planning and decisions.
- Features of practical adaptation include: making use of climate information, applying a cost-benefit rationale, broadening climate risk management, improving coordination and communication among involved stakeholders, making use of good practices and innovations.

Developing countries are particularly vulnerable to climate change, due to their often higher exposure to weather and climatic extremes and climate variability. Furthermore, their economies are often highly dependent on climate-sensitive resources, whereas their adaptive capacity is relatively low.

It is predominantly the poor who will be affected disproportionately. Climate change affects key

development sectors such as agriculture, water and human health more than the others. Consequently, it also affects the objectives of development measures, projects, policies and development planning on various levels.

Given that development choices today influence the adaptive capacity of people and their governments well into the future, there is ample opportunity, but also an urgent need, to integrate climate change considerations into development activities and decision-making. To ensure that adaptation is effective in supporting overall development objectives, it may be useful to consider the following when planning practical action:

- Adaptation should build on the best available information about impacts, vulnerabilities and adaptation options. An unprecedented amount of knowledge is available about experienced and expected change, yet uncertainties remain. Improving data availability, translating it into user-friendly information and choosing interventions on the basis of what can be known are key tasks ahead. Targeted interventions are possible when fairly clear-cut information about impacts is available. Otherwise, the precautionary principle (e.g. avoiding building in flood-prone areas, diversifying income sources) should apply and no-regret options (e.g. combating soil erosion) should be the focus.
- Presenting economic figures on how much can be saved by avoiding impacts and comparing the costs of the different options can help to promote adaptation and choose the most efficient among possible options. Knowledge on the economics of adaptation is clearly still limited, but\ recent studies provide both robust figures and methods that can be applied for prioritisation (World Bank 2010).
- Risk management is a key feature of adaptation. Current approaches dealing with climate risks have to be strengthened. They can range from risk reduction to risk sharing - e.g. in disaster management or water resources management. Climate projections will have to be taken into account and new methods and procedures are required.
- Adaptation may require complex governance processes. New stakeholders have to be involved, as climate change will require action by people who have not explicitly considered climate change in their past decisions.
- Communication among the different thematic communities will have to improve and strategies in the various areas need to be efficiently coordinated and managed. Capacity development is key in such a complex and dynamic environment.
- Often adaptation does not entail completely new things. In all sectors there is ample existing knowledge about and experience with specific techniques and management strategies that are of great value for addressing climate change. Increasing the robustness of livelihoods or agricultural systems, for example, is an important contribution to adaptation in itself. In this context, specific techniques like efficient irrigation or watershed management already contribute greatly to the adaptive capacity of regions. Building on an understanding of key climate change risks, such techniques can be improved, targeted or transferred to regions where they have not been previously employed. Improved knowledge and technologies, such as new crop varieties, may be further spread to promote adaptation to climate change.

C. ADAPTING TO CLIMATE CHANGE AND REDUCING DISASTER RISKS

Disasters and Climate Change are both development risks. There is a clear urgency to recognize the growing threat from these risks on achieving our national vision, goals and targets for sustainable

development in the decades ahead, and take necessary measures to address and manage these development risks in the mainstream processes.

Disaster Risk Reduction (DRR) is the development and application of policies and practices that minimizes risks to vulnerabilities and disasters, applies to managing/responding to current disaster risks. Climate Change Adaptation (CCA) is an adjustment in natural and human systems, which occurs in response to actual or expected climate changes or their effects. In human systems, adaptation can reduce harm or utilize opportunities.

Climate Change is an issue that cuts across a large number of sectors, actors and institutions. To determine adaptation needs in order to plan adaptation actions, it is crucial that we start from the country's "business as usual" development goals, plans and targets, and also its vulnerability to natural phenomena, hazards and extreme events particularly those which are climate induced.

The Hyogo Framework for Action establishes the concern for disaster management in a changing climate. Governments worldwide have recognized the importance of coordinating climate change adaptation with relevant natural disaster risk reduction measures and the need to integrate these considerations in a comprehensive manner into development plans and poverty reduction programmes.

Defining and redefining the risks through risk analysis, community risk assessment, research, modeling and observations inform development planning frameworks including development policy, project assessment criteria, agency plans and budgets, risk reduction action plans, NGO and Civil Society, private sector, etc. The framework guides adaptation to climate change impacts planning accordingly, and enable livelihood and development toward resilience.

Disaster Risk Reduction (DRR) and adaptation share commonalities in purpose in that they aim to reduce the vulnerability of societies to hazards by improving the ability to better anticipate, resist and recover from their impact. There is potential in drawing upon the national platforms and other DRR tools and experiences within and outside the Hyogo Framework for adaptation purposes. DRR, however, expands beyond weather-related disasters, while adaptation includes not only climate extremes, but also the more slowly evolving risks posed by climate change. Thus, while there are clear synergies which must be exploited, there are also some exclusive elements within DRR and adaptation which need to be addressed separately.

Disaster risk reduction builds the foundation for climate change adaptation. DRR takes care of risks from existing floods, prevailing droughts, etc. An example may be of raising the plinth of homes, settlement, schools, etc. on the basis of flood experience (impact) in the area or location. The goal is to reduce the risk of the structure from flood (hazard). Devastating floods are major natural hazards which are climate induced.

Both DRR and CCA address reducing risks of present development efforts, of past gains, and future aspirations. However, points to note are:

- All disasters (natural, human-induced) are not linked to climate. Examples are earthquake and tsunami, volcanic eruption, etc. which are "geological".
- All adaptation needs and actions may not require consideration of disaster risks, as they may provide "benefit" rather than "harm" development society and national pursuits.

Important point is that both DRR and CCA considerations are necessary in today's world, and more specially in the case of Bangladesh, from planning through delivery of development goals and targets.

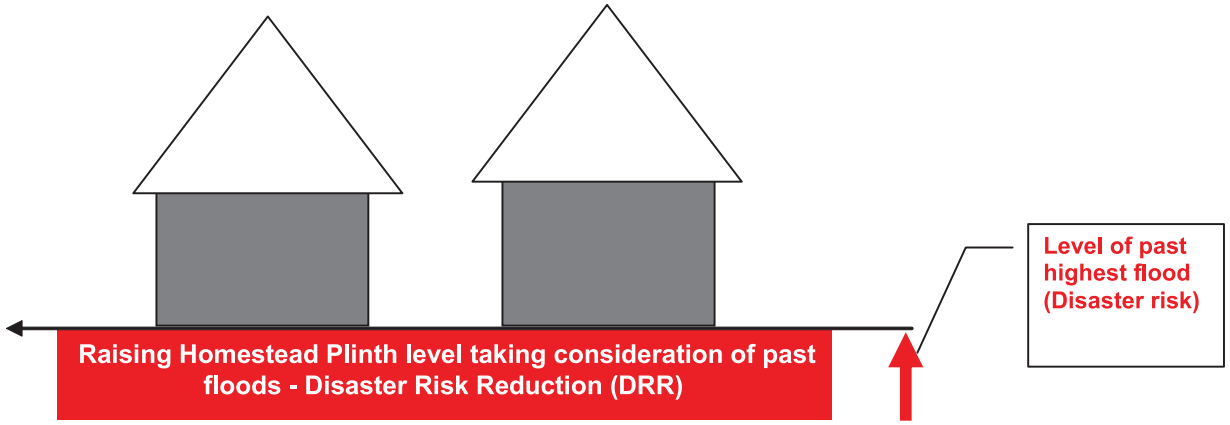


Figure 7.1 Disaster risk reduction by raising homestead (considering past floods)

Adaptation to adverse climate change impacts such as floods will need to consider both current disaster risks as well as risks following climate change

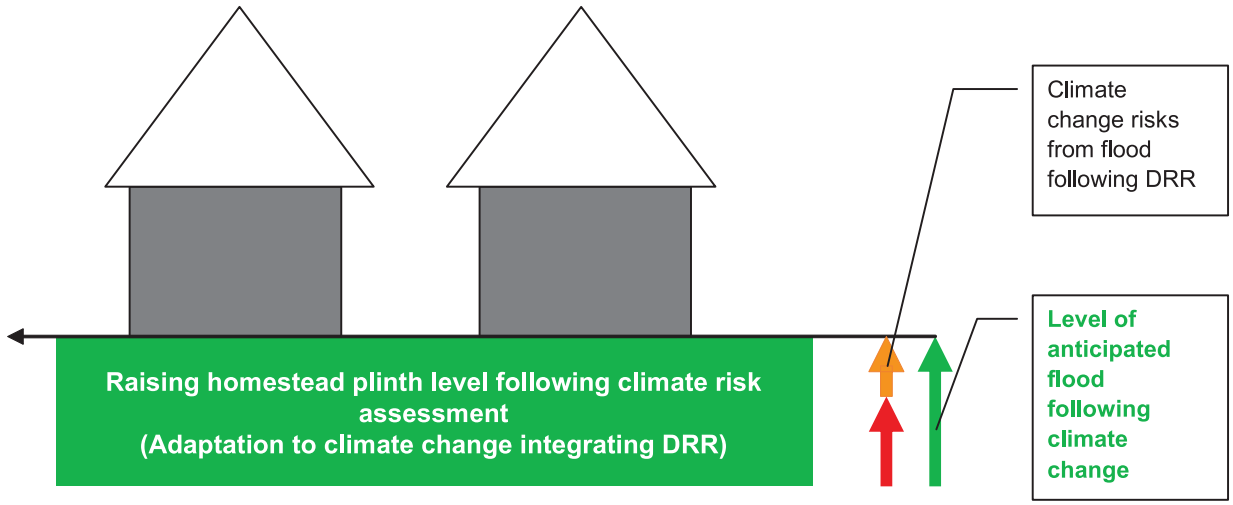


Figure 7.2 Disaster risk reduction by raising homestead (considering risk assessment result)

D. EXAMPLES OF ADAPTING TO CLIMATE CHANGE

Adaptation reduces the impacts of climate stresses on human and natural systems. It consists of a multitude of behavioral, structural and technological adjustments.

Adaptation measures can vary in their timing (anticipatory vs. reactive; ex ante vs. ex post), scope (short-term vs. long-term; localized vs. regional), purposefulness (autonomous vs. planned; passive vs. active) and adapting agent (private vs. public; societies vs. natural systems).

Examples of adaptation measures include changing crop varieties and altering farming practices, developing heat- and drought- resistant crops, diversifying livelihoods, building flood defences and land-use planning.

Nevertheless, the need to adapt to changing environmental and climatic conditions is not a new one. Societies throughout history have had to adapt to variations or changes in their climate through a variety of strategies and by using knowledge accumulated through experience of past climatic events. In

addition, societies have also had to cope with and respond to extreme weather events, such as droughts and floods.

For example, the Sahel region in Africa has historically frequently faced extreme climatic variability and events such as droughts. Societies in the Sahel have, therefore, had to regularly adapt to unreliable rainfall and drought conditions for example by diversifying their livelihoods and adopting new crop varieties.

A broad range of adaptation measures can be implemented in response to both observed and anticipated climate change. Such measures include altering farming practices and crop varieties, building new water reservoirs, enhancing water use efficiency, changing building codes, investing in air-conditioning, and constructing sea walls.

To better understand this diversity, it is possible to classify adaptation measures into the following generic options or categories (IPCC, 2001, based on Burton, 1996):

- Bear losses: All adaptation measures may be compared with the baseline response of "doing nothing" except bearing or accepting the losses. In theory, bearing loss occurs when those affected have no capacity to respond in any other ways (for example in extremely poor communities) or where the costs of adaptation measures are considered to be high in relation to the risk or the expected damages.
- Share losses: This type of adaptation response involves sharing the losses among a wider community. Such actions take place in traditional societies and in the most complex, high-tech societies. In traditional societies, many mechanisms exist to share losses among a wider community, such as extended families and village-level or similar small-scale communities. At the other end of the spectrum, large-scale societies share losses through public relief, rehabilitation, and reconstruction paid for from public funds. Sharing losses can also be achieved through insurance.
- Modify the threat: For some risks, it is possible to exercise a degree of control over the environmental threat itself. When this is a "natural" event such as a flood or a drought, possible measures include flood control works (dams, dikes, levees). For climate change, the major modification possibility is to slow the rate of climate change by reducing GHGs and eventually by stabilizing GHG concentrations in the atmosphere (i.e. mitigation).
- Prevent effects: A frequently used set of adaptation measures involves steps to prevent the effects of climate change and variability. For example, in agriculture such measures include: changes in crop management practices, such as increased irrigation water, additional fertilizer use, and pest and disease control.
- Change use: Where the threat of climate change makes the continuation of an economic activity impossible or extremely risky, consideration can be given to changing the use. For example, a farmer may choose to substitute a more drought tolerant crop or switch to varieties with lower moisture. Similarly, crop land may be returned to pasture or forest or other uses may be found such as recreation, wildlife refuges, or national parks.
- Change livelihood: People of certain livelihood group may change their professions while they are threatened by the change of condition due to changing climate and consequences. A realistic choice of livelihood option/s can serve as source of enhanced opportunities.
- Change location: A more extreme response is to change the location of economic activities by people and migrate to other areas. There is considerable speculation, for example about relocating major

crops and farming regions away from areas of increased aridity and heat to areas that are currently cooler and which may become more attractive for some crops in the future.

- Research: The process of adaptation can also be advanced by research into new technologies and new methods of adaptation.
- Encourage behavioural change through education, information and regulation: Another type of adaptation is the dissemination of knowledge through education and public information campaigns, leading to behavioural change. Such activities have been little recognised and have received low priority in the past, but are likely to assume increased importance as the need to involve more communities, sectors and regions in adaptation becomes apparent.

We may classify adaptation along a continuum of activities ranging from "pure" development activities with a vulnerability focus to measures with an explicit focus on climate change impacts. Four categories of adaptation along this continuum can be identified.

The first category includes activities that are fundamentally about increasing human development and thus address drivers of vulnerability. These activities focus on reducing poverty and addressing factors that make people vulnerable to harm, regardless of whether the stressors that can lead to harm are related to climate change. Although these activities do not consider climate change and its impacts, they can buffer households and communities from the impacts of climate change because they help to buffer them from nearly all stresses. Examples of activities falling under this category are gender initiatives, livelihood diversification efforts and literacy promotion.

The second category includes activities that focus on building response capacity. These capacity-building efforts lay the foundation for more targeted actions and tend to involve institution-building and technological approaches adapted from development approaches/tools/methods. Activities in this category may lead to more benefits than adaptation to climate change, but they tend to occur in sectors directly affected or sensitive to climate change. Examples of activities include participatory reforestation efforts to combat flood-induced landslides, natural resource management practices and weather monitoring.

The third category involves activities aimed at managing climate risk. Activities in this category focus more specifically on hazards and impacts and follow the concept of climate risk management. Activities following the climate risk management approach or based on it can be distinguished from typical development efforts through the use of climate information, although successful climate risk management activities may lead to strong development benefits. Disaster response planning activities and technological approaches, such as drought resistant crops, are examples of activities included in this category. In addition, "climate proofing" projects most often fall into this category, although many discrete adaptation activities may also focus on managing climate risks.

T**he fourth category involves activities with the objective of confronting climate change, and thus focuses almost exclusively on addressing climate change impacts**. Activities in this category tend to target climate risks that are clearly outside of historic climate variability and that stem from anthropogenic climate change. Examples of such activities are the relocation of communities in response to sea-level rise and responses to glacial melting. Radical or costly policies and technological approaches that explicitly address unprecedented levels of climate risk also belong to this category. Source: McGray, H. et al. (2007),

1	2	3	4
Addressing Drivers of Vulnerability	**Building Response Capacity**	**Managing Climate Risk**	**Confronting Climate Change**
Aim: To increase individual and community buffer capacity. All development activities are no-regret adaptation options that would also foster development if there were no climate change or the projections underpinning strategy did not become a reality.	Aim: To build robust systems for problem solving Development activities in critical sectors, such as natural resource management, biodiversity conservation, water, etc. with a focus on enhancing the target groups' explicit adaptive capacity.	Aim: To increase a system's resilience by strategically and systematically using climate information. Measures taken to 'Climate proof' development projects and programmes of all categories, i.e. assess their vulnerability to CC and design respective measures. Systematic assessments are also undertaken to aviod mal-adaptation, overlooking or misjudging.	Aim: To respond to a clearly CC-induced threat. As these would often incur high transaction cost and clearly push a system out of the 'comfort zone', tghe need for reliable information as well as additional funding is particulary highy.

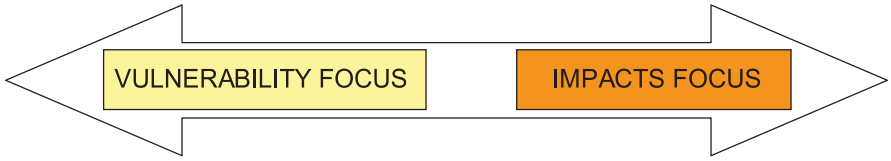


Figure 7.3 Category of Adaptation

Is past experience with adaptation sufficient for dealing with the impacts of climate change? Climate change will pose novel risks often outside the range of historical experience. These new risks include: increases in mean temperatures and sea levels; changes in precipitation patterns; melting of glaciers and permafrost; and changes in the intensity and/or frequency of extremes such as droughts, heat waves, floods and hurricanes.

Historical experience, therefore, is not sufficient as a guide to adapting to the impacts of climate change. Furthermore, despite a long record of dealing with climate variability, there is considerable evidence that many societies and sectors remain poorly adapted, even to current climate (IPCC, 2007, Chapter 17).

There is therefore a need to enhance resilience to current climate and to be better prepared to respond and adapt to impacts of climate change, which may fall outside of historical experience. Adaptation, however, will be undertaken by a wide range of actors, including individuals, communities, civil society, governments and private actors. Sustainable responses will therefore require all these actors to internalize current and anticipated climate risks in their various decisions, while being mindful of the associated uncertainties.

While a multitude of actors will need to adapt to climate change, governments and public agencies have a particularly important role to play in this regard. First, governments are the custodians for public assets (such as national parks) and provide services (such as clean water, health care and sanitation) which may be affected by climate change.

Second, governments establish rules and regulations that can enhance or constrain the ability of other actors to adapt to the impacts of climate change. These could include, for example, zoning regulations in areas that could be at risk from climate change, policies to promote more efficient water use in areas that might face greater water scarcity, and modified building regulations in areas that may be at enhanced risk of floods, hurricanes, or permafrost-related hazards.

Finally, governments are also responsible for investments in "public goods" such as monitoring of weather and climate, provision of weather forecasts, and research and development that could affect the ability of other actors to better adapt to the impacts of climate change.

How is adaptation different from regular development? Although adapting to climate change represents a new challenge, overlaps do exist between "business-as-usual" development strategies and adaptation. In some cases, activities undertaken to achieve development objectives can automatically lead to adaptation benefits.

For instance, decisions taken as part of development activities can have considerable bearing on the vulnerability of societies to the potential impacts of climate change. In principle, a range of development activities oriented towards reduced poverty and improved nutrition, education, infrastructure and health would be synergistic with adaptation to climate change. This is the fundamental principle of adaptive capacity as discussed in the IPCC (2007 and 2001): that better developed societies possess more adaptive capacity than less developed societies and therefore have lower vulnerability to climate change. Furthermore, in situations where vulnerability is primarily contextual, adaptation might simply require emphasis on baseline or business-as-usual economic development activities - alleviating poverty and improving nutrition, health care, livelihoods and so on - as these activities will also boost the capacity for coping with climate change.

However, while there are overlaps between adaptation and development, activities with an explicit focus on adaptation and climate change will also be required. For example, in cases where vulnerability is significantly exacerbated by the biophysical impact of climate change, adaptation will likely require more explicit consideration of climate risk in development activity. For example, in the Nepal Himalayas, infrastructure and livelihoods could be catastrophically affected by glacial lake outburst floods and glacier retreat resulting from rising temperatures (Agrawala et al., 2004). Thus, adaptation would require more direct measures to reduce exposure to such risks, going beyond baseline poverty reduction and economic development. In addition, business-as-usual development does not include activities that specifically aim to address climate change and reduce its impacts or take advantage of any new opportunities. For such action, explicit adaptation activities need to be developed. For example, in order to respond to the impact of climate change on coral reefs or the increased risk of glacial lake outburst floods, targeted adaptation activities need to be developed.

Further, in many cases (business-as-usual) development that does not take account of climate change is likely to lead to mal-adaptation (see Box below).

Box. Definition of mal-adaptation

Mal-adaptation is defined as business-as-usual development which, by overlooking climate change impacts, inadvertently increases exposure and/or vulnerability to climate change. Mal-adaptation could also include actions undertaken to adapt to climate impacts that do not succeed in reducing vulnerability but increase it instead. Mal-adaptation is bad from an economic point of view. World Bank estimates that a dollar invested in adaptation can save seven dollar to reduce loss, damage.

For example, new infrastructure may not be designed to cope with changed weather extremes and thus may either provide inadequate protection from extreme events or may have a shorter useful lifetime than intended. Such outcomes could retard development by allowing climate extremes to result in larger losses of life and destruction of property than would occur if infrastructure were built to withstand risks from climate change.

Agricultural investments may not pay off as expected if the climate is becoming unsuitable for particular crops. Yields could decrease and food would need to be imported, thus limiting economic growth. Activities promoting human settlement or infrastructure development in areas that may become unsuitable because of climate change could even increase a region's vulnerability. Such areas may become vulnerable to rising sea levels, changes in flood and drought frequency, more exposure to infectious diseases or heat stress, and other climate change-related risks.

Adaptation to Climate Change in Bangladesh

The observed impacts, predicted impact risks, and corresponding vulnerability provide rationale as well as directions to Bangladesh in identifying adaptation options and areas. The NAPA was the first to identify and prioritize adaptation actions (2005). BCCSAP identify adaptation needs and action plan for a period extending to 2021. A summary of sectoral vulnerability and adaptation options is described in the country's Second National Communications (SNC) in Table 5.21 (pages 177-180).

A number of projects addressing climate change has already been funded from Trust Fund and Resilient Fund, and are implemented by government ministries, agencies and departments. There is still little information on implementation status and progress at this very early stage.

On the ground, anticipated and planned adaptation to climate change started with the RVCC project in south-west Bangladesh (2003-2005). This unique initiative demonstrated examples of community based adaptation actions as well as processes which lead to successful outcomes. The lessons from experience of this project include a menu for adaptation actions, at local, community and family levels. (SNC, in Tables 5.22 and 5.23, pages 186-188). The SNC can be downloaded from MoEF and DoE websites.

The LACC Project (2004- 2009) through two phases of implementation, stands out in its focus on Livelihood and Adaptation, and identify and address systematically the climate impact risks for drought and coastal conditions (including salinity). The experience from the lesson has been well documented and provides a range of options for livelihood adaptation to climate change. DAE is implementing a project at present (2009-2014) extending and building on the lessons of the first two phases. Well organized and researched, the project has shared Option Menus for drought prone and coastal saline areas for Livelihood Adaptation to Climate Change (2009). This can be downloaded from the FAO documents library webpage.

The Community Based Adaptation through Coastal Afforestation Project is a flagship initiative of the country (GEF funded and Forest Department executed) currently under implementation. The project demonstrates early lessons and success in several areas. The options identified, tested and practiced may be accessed from the website www.undp.org.bd

CDMP has implemented a range of disaster risk reduction and adaptation measures, following identification and assessments using Community Risk Assessment and Risk Reduction Action Planning (CRA-RRAP) processes at Upazila and Union levels. Broadly, the interventions are of structural measures. A review and lessons from the implementation of these actions will provide useful information on their effectiveness and future course of action.

E. ADAPTATION WITH MITIGATION OPPORTUNITIES

Mitigation and adaptation are the two strategies for addressing climate change. Mitigation is an intervention to reduce the emissions sources or enhance the sinks of greenhouse gases. Adaptation is an 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC 2001).

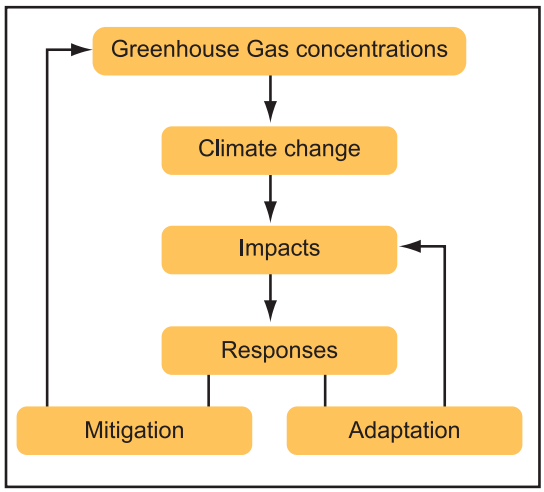


Figure 7.4 Adaptation and Mitigation due to Climate Change

How do adaptation and mitigation differ? Adaptation and mitigation present some notable differences, particularly in their objectives. Mitigation addresses the causes of climate change (accumulation of greenhouse gases in the atmosphere), whereas adaptation addresses the impacts of climate change. Both approaches are needed. On the one hand, even with strong mitigation efforts, the climate would continue changing in the next decades and adaptation to these changes is necessary.

However, adaptation will not be able to eliminate all negative impacts and mitigation is crucial to limit changes in the climate system.

Four types of inter-relationships between adaptation and mitigation have been identified (IPCC). These are

- Adaptation actions that have consequences for mitigation,
- Mitigation actions that have consequences for adaptation,
- Decisions that include trade-offs or synergies between adaptation and mitigation,
- Processes that have consequences for both adaptation and mitigation.

Two Examples of adaptation-mitigation opportunities

Sectors	Mitigation Option	Adaptation Option
Forest	Plant trees to capture CO_2	Protect embankment, riverbank, settlement, coast
Local Govt.	Plant vegetation to capture Co_2	Prevent landslide in hilly areas

EXERCISE - Participants will be requested to "Please fill in for each sector the answers to the topics in Column One. Add a new sector where relevant".

Table 7.2 Training Exercise Form

Adaptation	Sectors					
	agriculture	forest	water	biodiversity	coastal	disaster management
How does climate change impact						
What does adaptation mean						
Governance and policies for adaptation						
Adaptation options						
Linking adaptation and mitigation						

F. USING CLIMATE INFORMATION TO PLAN ADAPTATION

There is no doubt that our climate is changing. This will pose huge challenges to nations, organisations, enterprises, cities, communities and individuals. Developing countries, particularly Bangladesh will suffer most from the adverse consequences of climate change, and some highly vulnerable parts of the country and people are already being affected.

Vulnerability to natural hazards and climate change depends largely on physical and climatic settings of an area, socio-economic condition of a community, the magnitude, duration and consecutiveness of the hazard or change itself, among other things.

Assessment of such risk and vulnerability require credible information on existing climate and its trend, and the possible future climate and its variability. The information on future climate and its variability is usually obtained from general circulation models and regional climate model projection.

However, the information on existing climate and its trend is derived either from the analysis of the observed historical data or from the community perception and experience. The former being instrumental in nature is more reliable than the latter.

Such information on base climate and its trend when conveyed to the community people, risk analysts, and policy and decision makers help better assess the level of community risk and devise better mitigation and adaptation strategies and plans. Such information can also be useful in checking the reliability of climate model projections.

However, the information on long term climatic trends is scarce and inadequate on Bangladesh. The

spatial coverage in terms of the number of stations, the parameter coverage in terms of the number of climatic variables, the temporal coverage in terms of annual, seasonal, monthly, 10-day, etc., and the analytical soundness are often inadequate or not represent the entire country.

Furthermore, climate information is hardly available at community level which is at union or lower level. It is necessary to fill in this information and knowledge gap in order to devise appropriate policy and strategic measures and plan of action.

The generation of regional and local climate settings and trends is a difficult task and should give due consideration to the consistency, homogeneity and continuity of data, unequal length of available data, outliers and extreme values in available records, and appropriate statistical and mapping tools.

Practitioners and decision makers in developing countries like Bangladesh require enhancing their capacity to translate relevant aspects of climate change research into their every-day working contexts. This is precisely what decision makers, project managers and civil servants need and what was largely lacking.

This is possible following the concrete steps of (i) how to obtain climate change information, (ii) how to interpret it adequately, and (iii) how to communicate the resulting knowledge in a careful and responsible way.

There is increasing agreement that if temperatures rise by no more than 2°C the earth's integrity can be preserved and many of the potentially grave consequences of climate change could be avoided.

If GHG emissions continue to rise, the worst case scenario of an increase of the global mean temperature of up to 6°C is a real possibility. This would have disastrous consequences, yet even at the ambitious stabilization target of +2°C there would still be several regional negative impacts.

Therefore, while it is imperative to aim for ambitious reductions in GHG emissions, there is also an urgent need to adapt to the unavoidable consequences of climate change.

In order to make the necessary adaptation to the consequences of climate change, decision makers must be well informed.

At the international level, knowledge of the consequences of humankind's behavior on our climatic system-presented, for example, in the latest IPCC assessment reports - is well-founded and adequate for policy makers.

However, more specific information is needed for the implementation of concrete measures at the local level. It has been shown that the lack of such information is one of the severest bottlenecks to concrete action, in particular with regard to adaptation, but also for the implementation of integrated activities that would promote both mitigation and adaptation.

This session (and the corresponding learning objective) therefore should focus on ways to gather and interpret the relevant information for decision making. Development practitioners from both governmental and nongovernmental organizations will find this session an useful entry point to understand and explain climate information.

Related to the issues listed above, important questions often asked by practitioners include:

- What trends in climate change can be identified in a specific region?
- Who is affected by it, and in what ways?

- What sources of information exist as a basis for decision making?
- How reliable is this information?
- What options are there for adaptation and mitigation?
- How should we communicate relevant information to others?

A degree of uncertainty will always be involved due to the fact that in many cases no definite or comprehensive information about the impacts of climate change, or our vulnerability to it, can ever exist.

To be able to interpret climate change information we must first understand some of the approaches used in climate science. Therefore, it is necessary to gather a brief overview of climate (impact) research, and understand a few essential definitions. Basic climate modeling must also be understood, as well as impact, vulnerability and adaptation analysis.

Advice is required about how to gather a solid information base on regional climate change. We may identify useful points for those planning either stand alone or integrated programs, as well for anyone intending to mainstream climate change in their development activities, for example by "climate proofing" their investment decisions.

Adapting to and mitigating climate change calls for cooperation between the scientific and development communities.

The scientific approach to generating future climate information

The scientific method for gathering relevant climate change information can be divided into the following steps:

Global emission scenarios (SRES scenarios): based on so-called narrative storylines for humankind's development over the next 100 years, describe how GHG emissions might develop in the future.

The associated emission pathways are used as the basis for simulations using general circulation models (GCMs) often called global climate models, which calculate the interrelationship of the elements of the earth system and thereby project future climate trends. Regional climate models (RCMs) are based on the results of the GCM, and project the climate in more precise geographical detail. The results of the GCM and the RCM are (regional) climate change scenarios (not emission scenarios!) which describe, for example, how temperature, precipitation or other climatic parameters are expected to change in an area under investigation.

The effects of such climate scenarios on societies and ecosystems are investigated further in climate impact studies. These use vulnerability assessments and the analysis of adaptation strategies to provide stakeholders with relevant knowledge. Historical knowledge, i.e. experiences from historic events, can be of great value for this, for instance by helping to understand extreme events and for the identification of measures to adapt to their increasingly frequent occurrence in the future.

Besides this top-down, scientific approach, empirical local knowledge of climate variability and adaptation to it is also available. Such grassroots information is an important complement to the entire scientific top-down approach.

An overview of this process is given in Figure 7.5 and all the steps are discussed in more detail.

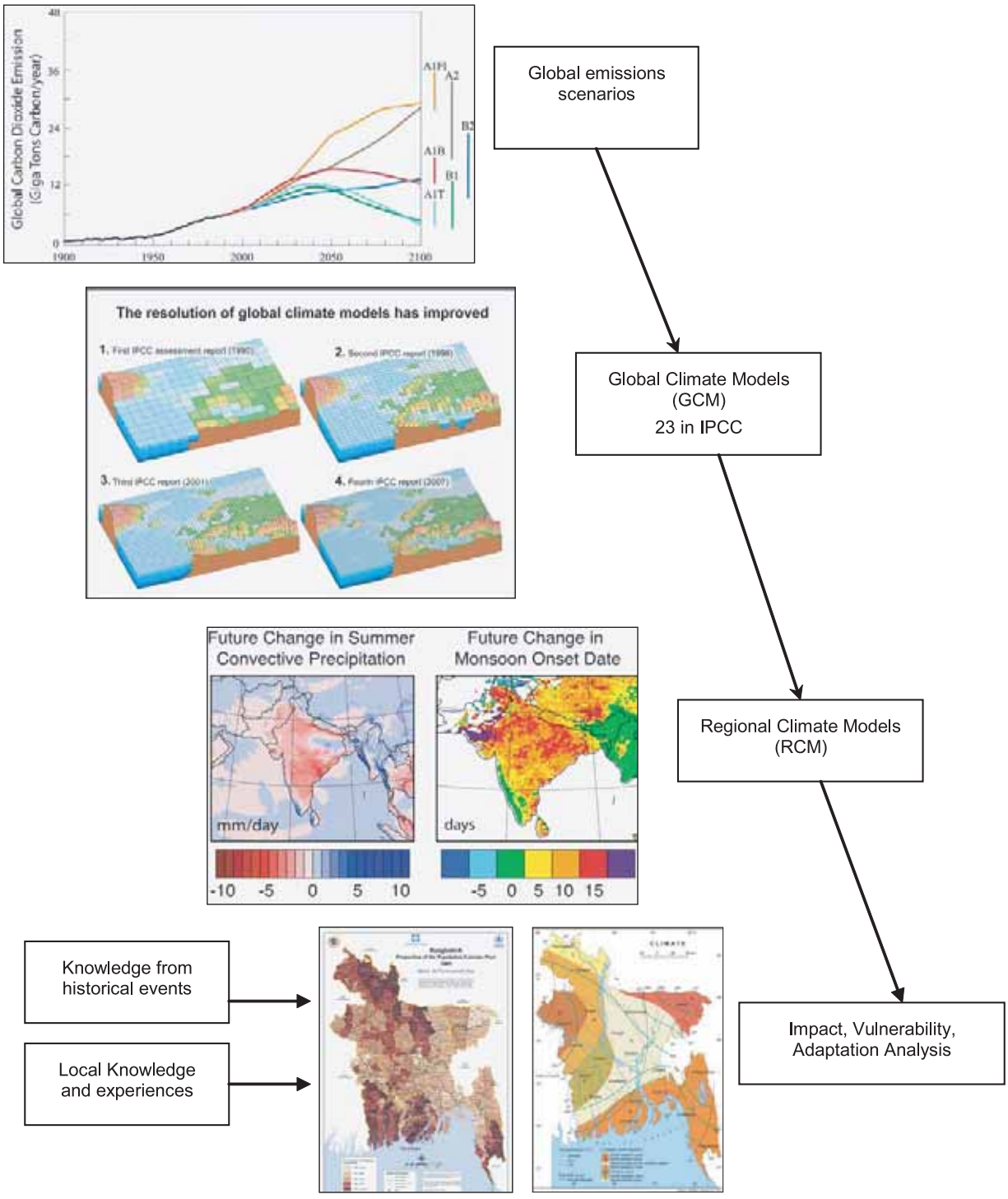


Figure 7.5 Steps to Generate Future Climate Information

1. EMISSION SCENARIOS

Between 1970 and 2004, GHG emissions increased from 28.7 to 49 gigatons of CO_2eq per year - a rise of 70 percent. Will this rapid increase continue in the coming decades? Future anthropogenic emissions will be determined by driving forces such as demographic and socioeconomic development, and technological change.

For example, a global population of 15 billion people; a mainly fossil fuel-based economy; an adjustment of income levels to match those in developed countries by 2050: all these things would boost GHG emissions. By contrast, a transformation to a low-carbon economy with seven billion people and moderate increases in income would stabilize GHG emissions. Both scenarios are plausible. The emission path humankind takes will depend on decisions made today and in the future. No one can predict what these decisions will be.

In other words, these emission scenarios present alternative visions of how the future might unfold. They are grouped into four "families", each of which contains scenarios that resemble one another in some respects.

Each climate model run is based on these emission scenarios, and therefore rests on specific assumptions about future emissions.

2. GLOBAL CLIMATE MODELS

Atmosphere ocean general circulation models, general circulation models (GCM) for short or often also called global climate models, are computer models that divide the earth into horizontal and vertical grid cells.

Each of the cells represents a specific climatic state for a specific time, based on a set of equations. Large computers are needed to calculate the mathematical equations for each cell, describing major components of the climate system and their interactions over time. The length of the edges of the grid cells range in size from approximately 100km to 200km, and are divided vertically into several levels covering both the ocean and the atmosphere.

Higher resolution is limited not by a lack of scientific knowledge but by the lack of adequate computing power. As new supercomputers become ever more powerful (they have increased by a factor of a million over the three decades since the 1970s), the resolution of the GCM is expected to increase further in the future. Today's GCM already count as the most complex and comprehensive computer models ever developed.

23 different models were taken into consideration for the fourth IPCC assessment reports. These vary according to the accentuation of the physical processes represented, and in terms of the grid resolutions. The results of all the models are generally consistent, which enormously increased their apparent trustworthiness, as shown in the latest is 2014 IPCC (2007) report.

3. REGIONAL CLIMATE MODELS

The global models often produce results that are inadequate for use in local assessments. Local climates are influenced significantly by smaller-scale features and processes, such as mountains, forests or lakes, the heat-island effect of large cities, etc. These features are not represented in detail in global climate models due to the low resolution. For instance, in a GCM, large mountain ranges like the Himalayas are

covered by just a few grid cells. More localized differences between regions at higher and lower altitudes, or specific climatic conditions in valleys cannot be represented.

For this reason, regional climate models (RCM) have been developed. Their resolution ranges from 10 to 50 km or refers to the station distribution in an observed area. There are two main types of regional climate model: statistical and dynamic6. The former analyze empirical data from weather stations and extrapolate the results into the future by using climatic trends taken from the GCMs. They have the advantage of being partly based on empirical local climatic knowledge.

Here it is a disadvantage that, in developing countries, empirical climate data are often not available for long periods without gaps, due to a lack of observational coverage. Therefore dynamic models are usually applied (e.g. PRECIS, CCLM, REMO), which work in a similar way to the GCM. They are nested into coarser GCM, which means that they use GCM outputs for calculating a potential climate evolution for the region under consideration. The simulation time needed for the regional models can be longer than that for the GCM because of the additional processes being represented in more detail.

4. IMPACT, VULNERABILITY, AND ADAPTATION ASSESSMENT

What does it mean if the temperature rises by 2 or 3 ºC, if the precipitation decreases by 30 percent, or if the sea level rises 50 centimetres? For decision makers to receive relevant information, data derived from GCM and RCM must be placed in the context of physical, socioeconomic and ecological processes, and the potential consequences of a changing climate must be deduced.

A variety of different methodologies is available for this, the success and quality of which should be judged in terms of their comparability, transferability and transparency.

Vulnerability assessments play an important role in identifying potential sectoral or regional hot spots for the impacts of climate change. A non-comprehensive list of these scientific methodologies (which in most cases require technical knowledge and expertise) can be found on the Internet.

As climate change is often not the only driver of change, some more sophisticated impact, vulnerability and adaptation assessments also include future socioeconomic, land-use and technology scenarios in an integrated approach.

The amount of detail involved varies widely, ranging from short studies to intense and long-lasting scientific research, including participatory processes with different stakeholders. Thus, the costs of performing assessments can also vary significantly.

5. KNOWLEDGE OF HISTORICAL EVENTS

In some cases, historical events can give a clear picture of the impacts of climate change. One prominent example is the European heat wave of 2003. This extreme event caused a death toll of at least 30,000, mainly elderly people. Viewing this against climate projections, one can see that an event like this could be a normal occurrence by the 2040s, and that by the end of the century it might even count as cold. Therefore, one can benefit a lot from such knowledge when planning to adapt to future conditions.

6. LOCAL (NON - EXPERT) CLIMATE KNOWLEDGE

An important source of information that is often neglected is the knowledge possessed by local people. Worldwide, over a period of millennia, humankind has responded to catastrophic weather events and

changing climatic conditions. Although this knowledge is sparse, and in some cases highly subjective, it can be very informative.

It has the advantage of being locally and regionally specific and comprehensive. It may range from specific weather parameters to local vulnerabilities and adaptation strategies. Furthermore, it can help to assess the plausibility of scientific findings; it supports learning and provides hints for adequate action.

Uncertainty and risk assessment

It is better to be vaguely right instead of precisely wrong (Karl Popper)

Science does not give exact or certain forecasts of the future climate, and it will never be able to do so. But it would be wrong to conclude that no action on adaptation can therefore be taken. Uncertainty is not the same as ignorance; it is something that confronts many decision makers-not only in the field of climate change.

Companies have to take strategic decisions despite high levels of uncertainty about future markets. Politicians pass new laws without knowing exactly what effects they will have. In our day-to-day life we take many decisions without having enough validated information.

What would one rather believe, a scientist's projection of the climate for the next 50 years or an economist's stock market prognosis for the next five years? To assess uncertainty-to judge its magnitude and find out its origins-is ultimately the responsibility of the decision maker.

Climate research simply provides all the relevant information. Therefore, the challenge that faces adaptation practitioners is to manage rather than overcome the uncertainty! There are several reasons for uncertainty about climate change information. The single largest of these is the fact that we cannot predict the future level of GHG emissions. Many different "emission futures" are possible.

Scientists allow for this by using different emission scenarios. By comparing the climate model outcomes for the different emission scenarios, the range of possibility for future climatic developments can be seen.

MODULE 8

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE

MODULE 8

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE

OVERVIEW OF MODULE

DURATION		Training Course: 90 Minutes
OBJECTIVES		At the end of the Module 8, the participants will learn and be able to explain 1. What is climate mainstreaming 2. Rationale and objective of adaptation mainstreaming 3. How adaptation mainstreaming may take place 4. Mainstreaming Strategies and Options 5. Steps to Integrate Adaptation Planning
COVERAGE		A. Definition and concept of climate mainstreaming B. Why climate change adaptation mainstreaming necessary, Objectives of adaptation mainstreaming in sector plans and process C. How adaptation integration may take place in mainstream plans and processes D. Mainstreaming Strategies and Options E. Steps to Integrate Adaptation Planning
SUGGESTED METHOD		Presentation and discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT IS CLIMATE MAINSTREAMING

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain what is meant by climate mainstreaming.
KEY POINTS		Climate mainstreaming (integrating climate change adaptation) is incorporation of priority climate change responses into development projects, strategies, policies and measures (either at the national level or within development agency programming) to reduce potential risks. Mainstreaming Disaster Risk Reduction and Climate Change Adaptation are long-term processes of engaging with development actors at all levels and identifying suitable sustainable entry points for such engagements. A change in organizational culture may be needed to ensure integration of risk reduction concerns at all levels of development oriented activity. Political commitment and motivation, including financial support can contribute to strengthening the required organizational culture.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 8 Contents

B. RATIONALE AND OBJECTIVE OF ADAPTATION MAINSTREAMING

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the rationale for and objective of climate mainstreaming
KEY POINTS		Mainstreaming adaptation is not a technical activity; it requires more than just developing appropriate approaches and tools. Integration of adaptation is a long-term process of engaging with development actors at all levels and identifying suitable sustainable entry points for such engagements. The objectives of mainstreaming must be guided by sector goals, targets and challenges. Also, relevant strategies and options to mainstreaming (implementing the integration process) disaster and climate risks into the policies, institutions and processes governing the overall development and management of the sectors in question must be identified, understood, agreed and applied.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 8 Contents

C. HOW ADAPTATION MAINSTREAMING MAY TAKE PLACE

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain how mainstreaming climate change may take place in plans and projects
KEY POINTS		Integration of disaster and climate risks and responses into national, sectoral and project/programme levels can take place within mainstream flow of activities. At the national level, consider various stages of the policy cycle while formulating policies, national long term visions and short to medium term policies and plans. In doing so, we must recognize climate and disaster risks. At the planning stage, while considering multi-year or annual development plans, consider the climate and disaster risks and include risk reduction and adaptation specific programmes and projects. In the resource allocation stage, while considering the national budget, reallocate funds to more vulnerable sectors and/or regions. The sector-level planning and implementation processes already in place can integrate CCA at each stage of its cycle. For example, at the policy formulation stage, sectoral strategies and policies require considering action on risk priorities established at the national level, include recognition of disaster and climate risks, and application of a climate screen/lens The project cycle also offers the scope for integrating disaster risk reduction and climate change adaptation. At the project identification stage, potential climate and disaster risks, effects on vulnerability need to be identified. At the project appraisal stage, in-depth climate and disaster risk assessment need to be undertaken. In the project design stage, identify risk reduction and adaptation options, and also prioritize and select option(s). In the implementation stage, for new projects selected adaptation options will be implemented, while for ongoing projects left-out interventions of previous stages also need to be carried out. In the final stage, implementation of adaptation measures and projects need to be monitored and evaluated, so that lessons learned from ongoing interventions could be utilized in future course of actions, as well as, good practices can be replicated and scaled-up.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 8 Contents

D. MAINSTREAMING STRATEGIES AND OPTIONS

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain strategies and options to mainstream adaptation.
KEY POINTS		Key Strategies to operationalize adaptation mainstreaming include: Awareness raising, enabling environment, development of necessary tools, training and technical support, changes in operational practices, measuring progress, learning and experience sharing.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 8 Contents

E. STEPS TO INTEGRATE ADAPTATION PLANNING

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the steps to integrate adaptation into planning
KEY POINTS		To evolve and establish the integration process, an 8-Step process may be applied. 1 Understanding disaster and climate risks 2 Contextualizing risks in relation to sectors and concerned agencies/departments 3 Exploring range of risk reduction options in relation to mandated goals, targets 4 Identify priorities, needs, gaps, cross- and inter-sectoral linkages 5 Planning to address priorities, needs, gaps, cross- and inter-sectoral concerns 6 Mobilizing Resource: internal and external 7 Implementing priority Risk Reduction activities as anticipatory interventions, address needs, filling gaps 8 Review & monitor disaster and climate proofing of activities and feedback
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations Module 8 Contents

MODULE 8

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE

TRAINER'S GUIDE

TOPICS FOR DISCUSSION

Climate change risks and adaptation needs to be integrated into mainstream development planning and processes. Module 8 discusses processes for adaptation mainstreaming. Approaches and steps to consider for mainstreaming are also discussed.

MODULE CONTENTS

Bangladesh has specific development aspirations and needs which consider the survival and well-being of its people at the forefront. Development planning is a conscious effort that matches resources and optimizes their use to address identified needs and aspirations.

Development aspirations are dis-aggregated into Sector-wise goals, targets. Policies and Strategies are provided to enable processes that translate plans into action. Institutions, government and non-government act as instruments with their mandates to perform and achieve goals, targets. To this end, it is crucial that development planning in Bangladesh takes consideration of disaster risks from hazards and risks from climate variability and change.

Mainstreaming Disaster Risk Reduction and Climate Change Adaptation are long-term processes of engaging with development actors at all levels and identifying suitable sustainable entry points for such engagements. A change in organizational culture may be needed to ensure integration of risk reduction concerns at all levels of development oriented activity. Political commitment and motivation, including financial support can contribute to strengthening the required organizational culture.

> Climate mainstreaming (integrating climate change adaptation) is incorporation of priority climate change responses into development projects, strategies, policies and measures (either at the national level or within development agency programming) to reduce potential risks.
>
> *Based on Klein et al. 2007 and OECD 2008*

Mainstreaming also requires effective partnerships among and within a wide range of actors and sectors. In addition to building internal organizational capacity, successful integration may require conducive relationships with groups and actors that influence the wider response. This includes local partner organizations, donors and other INGOs, and national and international constituencies supporting the organization. DRR and CCA mainstreaming is as much a question of inter-organizational capacity and coordination as it is one of internal organizational development. Mainstreaming processes must recognize that development (national, sectoral, local, organizational, or household) means well being of individuals and the society, the economy and the environment.

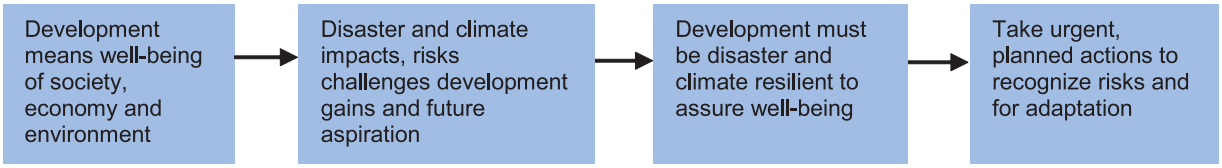


Figure 8.1: Development - Risk Reduction Planning Links

B. RATIONALE AND OBJECTIVE FOR CLIMATE MAINSTREAMING

Why mainstreaming Climate Change Adaptation is essential as the above definition for mainstreaming describe, integration is not a technical activity; it requires more than just developing appropriate approaches and tools. Integration of adaptation is a long-term process of engaging with development actors at all levels and identifying suitable sustainable entry points for such engagements. A change in organizational culture may be needed to ensure integration of risk reduction concerns at all levels of development oriented activity. Political commitment and motivation, including financial support, can contribute to strengthening the required organizational culture.

Integration also requires effective partnerships among and within a wide range of actors and sectors. In addition to building internal organizational capacity, successful integration may require conducive relationships with groups and actors that influence the wider response. This includes local partner organizations, donors and other INGOs, and national and international constituencies supporting the organization. Adaptation mainstreaming is as much a question of inter-organizational capacity and coordination as it is one of internal organizational development.

Objectives of Adaptation Mainstreaming in Sector Plans and Processes: The objectives of mainstreaming must be guided by sector goals, targets and challenges. Also, relevant strategies and options to mainstreaming (implementing the integration process) disaster and climate risks into the policies, institutions and processes governing the overall development and management of the sectors in question must be identified, understood, agreed and applied.

The key objective guiding disaster risk reduction and climate change adaptation mainstreaming in sectors in Bangladesh is climate proofing development in the sector. This implies that mainstreaming or implementing the integration of disaster and climate risks and corresponding vulnerability of sector consideration into development planning and management at each and every level of operation. The degree of progress made in this regard will very much depend on how development planning and management in the sub-sectors embrace the overall concerns and act accordingly.

Caution should be taken not to expect end results, as mainstreaming is a process which will evolve and consolidate over time and effort given. However, some indicators of progress need to be identified to steer the process toward expected results.

C. INTEGRATION AT THE NATIONAL, SECTOR AND PROJECT/PROGRAMME LEVELS

Integration of disaster and climate risks and responses into national, sectoral and project/programme levels can take place within mainstream flow of activities. Figures 8.2.and 8.3 shows how these activities would be integrated in the prevailing systems and institutional arrangements in a simple diagrammatic way.

At the national level, consider various stages of the policy cycle while formulating policies, national long term visions and short to medium term policies and plans. In doing so, we must recognize climate and disaster risks. At the planning stage, while considering multi-year or annual development plans, consider the climate and disaster risks and include risk reduction and adaptation specific programmes and projects. In the resource allocation stage, while considering the national budget, reallocate funds to more vulnerable sectors and/or regions. Using the horizontal fund for CCA already in place (e.g. Bangladesh Climate Change Fund of Tk 700 crores in FY 2009-10), the decision makers can allocate funding for DRR/CCA specific activities. Finally, in the programming and implementation stage, while considering the

development plans and budget allocations for each sector for a specific time period, funds will need to be allocated for specific CCA activities for the respective sectors. (see Figure 8.2)

The sector-level planning and implementation processes already in place can integrate CCA at each stage of its cycle. For example, at the policy formulation stage, sectoral strategies and policies require considering action on risk priorities established at the national level, include recognition of disaster and climate risks, and application of a climate screen/lens (Figure 8.3). At the planning stage, the sector plan should incorporate sector level (including cross-sectoral) adaptation activities identified at national level through the application of a climate screen/lens. In the resource allocation stage, make room in the budget for cross-sectoral adaptation activities, and claim resources from a horizontal fund for adaptation (such as the Bangladesh Climate Change Trust Fund) as well. In sectoral programming, add climate considerations to criteria used for assessing project proposals, incorporate adaptation activities identified during sectoral planning stage.

The project cycle also offers the scope for integrating disaster risk reduction and climate change adaptation. At the project identification stage, potential climate and disaster risks, effects on vulnerability need to be identified. At the project appraisal stage, in-depth climate and disaster risk assessment need to be undertaken. In the project design stage, identify risk reduction and adaptation options, and also prioritize and select option(s). In the implementation stage, for new projects selected adaptation options will be implemented, while for ongoing projects left-out interventions of previous stages also need to be carried out.

In the final stage, implementation of adaptation measures and projects need to be monitored and evaluated, so that lessons learned from ongoing interventions could be utilized in future course of actions, as well as, good practices can be replicated and scaled-up.

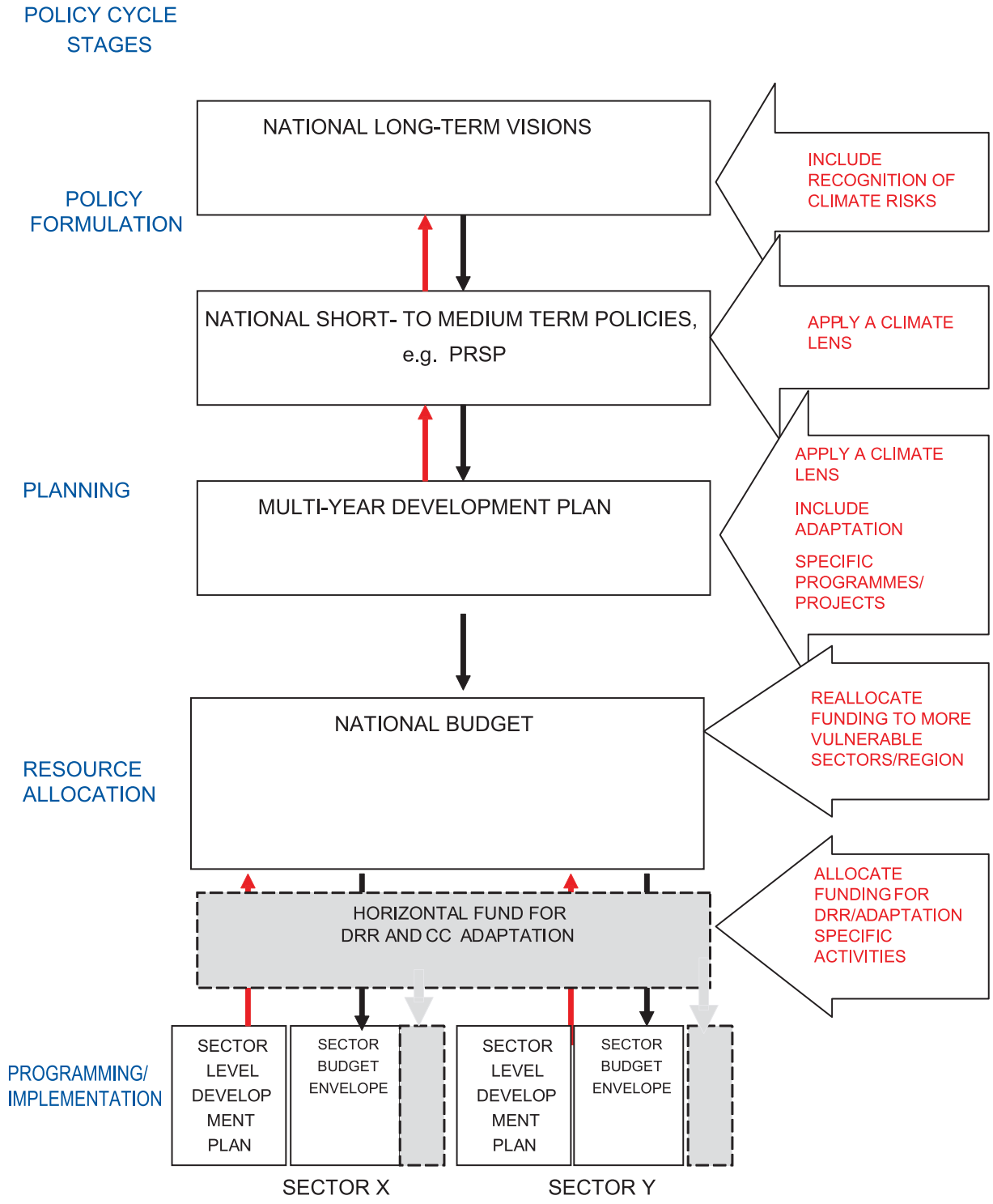


Figure 8.2 : National Level Planning and Implementation Processes with Key DRR/CCA Interventions

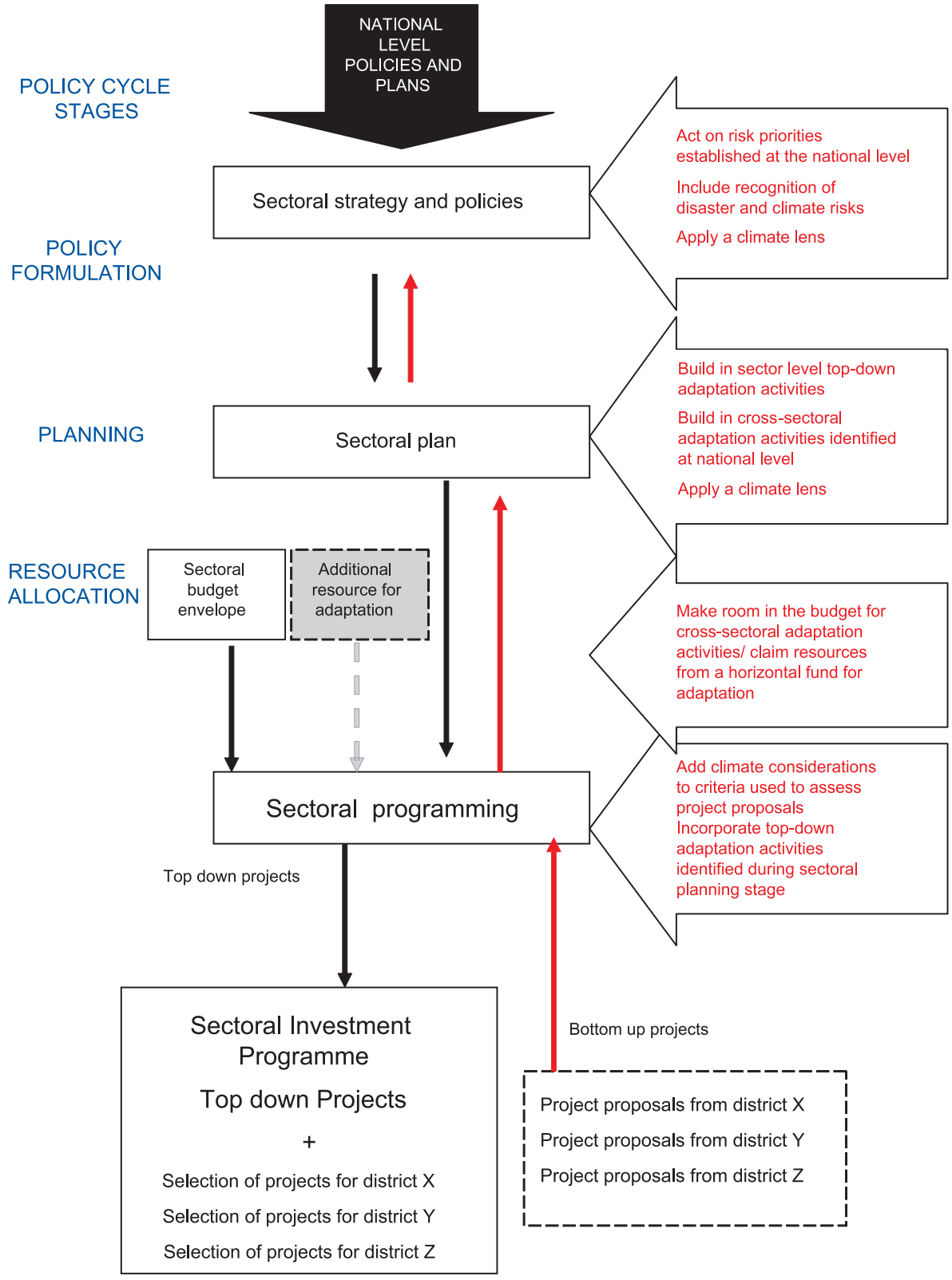


Figure 8.3: Sector Level Planning and Implementation Processes with Key DRR/CCA Interventions

D. MAINSTREAMING STRATEGIES AND OPTIONS

Integration of climate and disaster risks into development considerations in different development sectors will need practical and workable strategies and options. The following strategies may serve as guide to integrate and mainstream adaptation in the sector development plans and processes.

Key Strategies to operationalize adaptation mainstreaming include:

1. **Awareness Raising:** For example, incorporates two concepts, both of which are relevant to this process: the need for an appreciation and understanding of the relevance of DRR and CCA for sustainable development; and, greater accountability (government need to "assume greater responsibility for the country's and people's vulnerability and actively seek to reduce risk").
2. **Enabling Environment:** The success of any integration process will depend to a large extent on the proactive organizational environment as well as policy and institutional set-up.
3. **Development of Tools:** Integration may require development of tools (e.g. screening tools for identification of risks and RR measures), methods, techniques, etc. to facilitate awareness raising, enabling environment, training and technical support, change in operational practice, measuring progress and learning and experience sharing.
4. **Training and Technical Support:** Organizations may require technical support and professionals may need training to address needs and gaps to integrate DRR and CCA in mainstream activities.
5. **Change in Operational Practice:** Often, integration of DRR and CCA into mainstream activities will require changes in the way some activities and practices take place. This will require specific guidance on how to make the necessary changes in operational practice.
6. **Measuring Progress:** To measure the progress that takes place following efforts to integrate DRR and CCA, there needs to be a systematic monitoring process/ approach in place within the organization as well as outside. This will help identify areas where more effort is required.
7. **Learning and Experience Sharing:** The effort, experience and lessons in implementing and operationalizing the integration process need to be shared within organizations as well as between different organizations and agencies participating in the integration process.

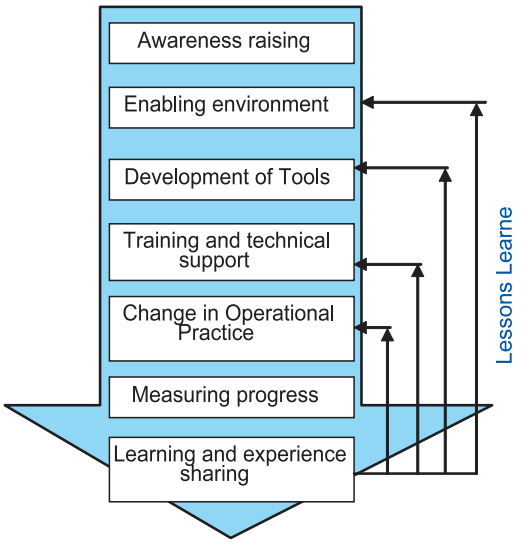


Figure 8.4 Mainstreaming Strategies

Implementing Adaptation Mainstreaming: The '8-Steps'

How will the mainstreaming take place? Targeted Ministry, (example: Ministry of Fisheries and Livestock) and its Agencies/Departments will need to work within their respective scope of works as well as between their different counterpart and cooperating Ministries and their Agencies/Departments.

The strategies described above can be used to evolve and establish the integration process. This can be done in 8-Steps. It should be noted that the steps offer a simple iterative approach which is flexible in its design and use. Also, the duration of each of the steps may vary from Ministry to Ministry and Agencies and Departments owing to different levels of organizational dynamics, culture and mandate.

The 8-Steps are briefly described below, with practical examples and activity:

1. **Understanding disaster and climate risks**
   Through their DRR and Climate Change Focal Points, all staff and functionaries in the Ministry of Fisheries and Livestock, its Departments and Agencies, and particularly the staff in planning and project development, need to understand how natural and man made hazards impact on Bangladesh, what are the risks on different sectors, and aspects of well being and development, both in the near as well as long term, etc. Organizing awareness campaigns, events, orientation and learning sessions inside the Ministries as well as participating in those outside can be of immense help, if continued and updated periodically and systematically. Also, introducing sessions and modules in training and workshops addressing climate and disaster risks to development, environment and our future can be useful if well planned and if the experience and learning feedback into the performance of roles in DRR and CCA. Knowledge management and sharing from the start can facilitate better coordination required to understand climate and disaster risks.

2. **Contextualizing risks in relation to sectors and concerned agencies/departments**
   The Ministry of Fisheries and Livestock, its Agencies and Departments, first need to be on-board, in rationale, spirit and commitment to understand how, and to what extent, disaster risks and climate change adverse impacts affect their respective sectoral mandates and responsibility, what are the key concerns, and what are their current roles in DRR (as described in the SOD to begin with) and adaptation to CC (as described in the BCCSAP) and in overall sectoral development planning (through PRSP, FYP, ADP, etc). Sector Ministry and affiliates may also require screening tools for identification of problems and setting targets/objectives as well as specific techniques, trainings and other capacity enhancement support services to contextualize risks to their respective work areas.

3. **Exploring range of risk reduction options in relation to mandated goals, targets**
   Once the Ministry of Fisheries and Livestock, its Departments and affiliates have understood the impacts of disasters and climate change in general, and have contextualized the risks in relation to their sectors and concerned affiliates, the next step is to review and assess the range of disaster and climate risk reduction options in relation to the sectoral goals, targets, as well as to respective agency/department mandate. This could include a range of options which are locally proven, or applied/learnt from practices and technologies proven elsewhere.

   A large number of these options may require the cooperation, involvement or engagement of other Ministries, Affiliates, non-government actors and institutions. The range of options should also be sufficiently broad, covering the risk management and reduction needs of every section of society, and more particularly those who are poor and already vulnerable. The option should be shared widely within the sector as well across to those who may be direct or indirect stakeholders in planning and implementing the DRR and CCA options. Sectors and concerned Ministry and affiliates may also require tools and techniques, training and other capacity enhancement support to explore risk reduction options in relation to mandated goals and targets.

4. **Identify priorities, needs, gaps, cross- and inter-sectoral linkages**
   The Ministry of Fisheries and Livestock must then identify its priorities, needs and gaps in reducing climate and disaster risks, taking both cross- and inter-sectoral concerns. This may be guided by the macro policy and planning guidelines such as SODs, BCCSAP, PRSP, FYP, Annual and Sector Development Plans, etc. or any other acts, policies or directives. The priorities, needs and gaps identified should be disseminated widely within respective sector stakeholders as well across to other

relevant Ministries and organizations. Concerned authority can then undertake to address these gaps, needs and priorities systematically over time in the development planning, implementation and review processes.

5. **Planning to address priorities, needs, gaps, cross- and inter-sectoral concerns**
   Planning requires sufficient understanding of development risks, which includes risks from climate change and disasters, contextualized to respective sectors as well across different sectors, identified range of risk reduction options, needs and gaps, the goals, targets, mandate of the Ministry, and timescale considered. DRR and CCA planning to address priorities, needs and gaps can be inter-dependent and inter-linked on many occasions. For example, planning DRR in rural homes and settlement may consider reducing risks from flooding based on the likelihood of a 1998 level flood happening again, which would provide one option of raising the plinth level or elevating the homes and settlement above the 1998 flood level.

   However, climate impact predictions may forecast floods of higher intensities, duration and extent of coverage, which may result in inundation levels higher than the previous highest flood (1998). Adapting to CC may therefore inform the planning authorities to encourage and ensure raising of plinths of homes and settlement or elevating other infrastructures like markets, schools, clinics, etc. well above 1998 flood level and above the prediction levels for say, the years 2020 or 2030 or 2050. Also, integration in sectoral planning may require the coordination with other concerned Ministries, like LGRD&C, Land, Water, and Agencies like DPHE, LGED and BWDB may be relevant functionaries in elevating homesteads and infrastructure to reduce flood risks.

6. **Mobilizing Resource: internal and external**
   Integrating disaster risk reduction and adaptation to climate change into development as well as sectoral plans will require budgeting and allocation of resources (both domestic and foreign) which consider the additional requirement to what would be required in a 'no risk' development scenario. For example, the MoWR may need to consider additional resources in embankment development and maintenance following prioritizing DRR and CCA for flood protection. The concerned authority should note how much losses and damages are reduced by investing in DRR and CCA and integrating them into development plans and implementation.

7. **Implementing priority Risk Reduction activities as anticipatory interventions, address needs, filling gaps**
   Once the fisheries and livestock sector or development plan which has incorporated DRR and CCA considerations is implemented following resource mobilization, priority risk reduction activities will be implemented. These will address needs and fill gaps as earlier identified. The agencies, professionals and staff who will be responsible for implementation of sector plans, programmes and projects should understand the rationale for the additional investment and resources required for DRR and CCA integration. Additional capacity enhancement, including training and technical support, and changes in operational practice may be required in this respect.

8. **Review & monitor disaster and climate proofing of activities and feedback**
   The Ministry of Fisheries and Livestock, its affiliates and stakeholders should review and monitor progress made in DRR and CCA integration into their respective activities, programmes and projects, with a view to identify lessons learned and to share the experience with others. The feedback could facilitate enabling environment, or bring about necessary changes in operational practices.

Adaptation to climate impacts and disaster risk reduction must be seamlessly integrated into any development planning and policy. This step wise plan for integration of DRR and CCA aims to achieve the desired goal. A 'continuing learning by doing and practice' approach is required, focusing on national capacity as well as at different levels and across sectors, to ensure that development planning and implementation across sectors and all levels integrate disaster and climate change risks.

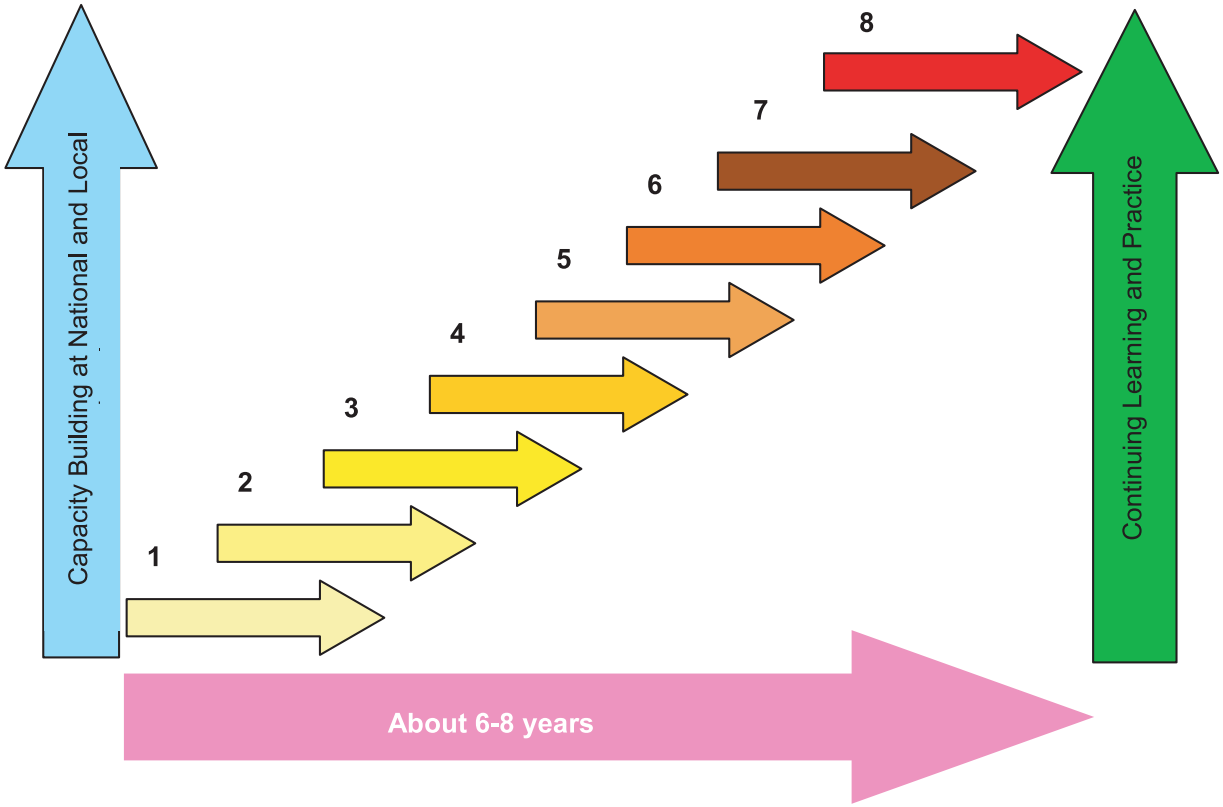


Figure 8.5 Steps toward Integration of Disaster and Climate Risk Reduction into Fisheries and Livestock Development Planning and Processes

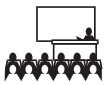
MODULE 9

Climate Change and Gender

Climate Change and Gender

MODULE 9

OVERVIEW OF MODULE

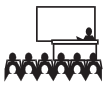
DURATION		Training Course: 80 minutes
OBJECTIVES		At the end of the Module 9, the participants will have: 1. Gained a working knowledge on the concepts of gender dimensions of climate change in Bangladesh. 2. Been oriented about specific gender-based disparities that contribute towards the unequal exposure and vulnerability of women to the effects of climate change. 3. Gained understanding of the role of women as key agents of change in responses to climate change.
COVERAGE		A. What is the gender dimension of climate change? B. What are the gender-based disparities contribute towards the unequal exposure and vulnerability of women to the effects of climate change? C. What is the role of women in climate change adaptation?
SUGGESTED METHOD		Structured learning exercise: Film show or Group activity Exercise - 1: Direct and indirect risks of climate change and their potential effect on women
OUTPUTS		A systematic understanding of gender dimension of the climate change and role of women in climate change adaptation.
RESOURCES Supplies and Equipment Visual Aids Handout		White Board and Marker, LCD Projector, Computer Power point presentations Module 9 Contents

SESSION GUIDE

A. WHAT IS VULNERABILITY TO CLIMATE CHANGE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the concepts of gender and gender dimension of climate change.
KEY POINTS		Gender refers to roles, responsibilities, rights, relationships and identities of men and women that are defined or ascribed to them within a given society and context - and how these roles, responsibilities and rights and identities of men and women affect and influence each other. Gender inequalities intersect with climate risks and vulnerabilities. Women's historic disadvantages - their limited access to resources, restricted rights, and a muted voice in shaping decisions - make them highly vulnerable to climate change. The nature of that vulnerability varies widely, cautioning against generalization. Because climate change affects women and men differently, a gender equality perspective is essential when discussing policy development, decision making, and strategies for mitigation and adaptation.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handout		White Board, and Marker, LCD Projector, Computer Power point presentations Module 9 Contents

B. WHAT ARE THE GENDER-BASED DISPARITIES CONTRIBUTE TOWARDS THE UNEQUAL EXPOSURE AND VULNERABILITY OF WOMEN TO THE EFFECTS OF CLIMATE CHANGE?

DURATION		Training Course: 20 minutes
OBJECTIVES		At the end of the session, participants will be able to explain how the gender-based disparities contribute towards the unequal exposure and vulnerability of women to the effects of climate change.
KEY POINTS		Vulnerability is a reflection of the state of the individual and collective physical, social, economic and environmental conditions at hand. These individual and collective conditions are shaped by many factors, among which gender plays a key role. Women are not vulnerable because they are "naturally weaker": women and men face different vulnerabilities due to their different social roles. For example, many women live in conditions of social exclusion. Women become vulnerable in many ways because of the socio-cultural context of Bangladesh. Women usually have to get clear approval from their husbands to go out of their homes for any purpose. Without husbands' permission they do not have the right or social ability to move towards safe shelter centre leaving their homes even during disaster.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handout		White Board, and Marker, LCD Projector, Computer, Power point presentations Module 9 Contents

C. WHAT IS THE ROLE OF WOMEN IN CLIMATE CHANGE ADAPTATION?

DURATION		Training Course: 40 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the role of women in climate change adaptation.
KEY POINTS		The changes of the climate and its impacts are already occurring and touching the lives of poor people all around the world, especially in developing countries. In Bangladesh, women are not only victims of climate change; they are also effective agents of change in relation to adaptation, mitigation and disaster reduction strategies. Adaptation involves a range of activities to reduce vulnerability and build resilience. The key sectors concerning women's activities to adapt to climate change are Agriculture, Water, Food Security, Forests, Health and the Economy. Traditionally, women have been working and are still assuming their responsibilities in these sectors in most communities, so one needs to underline, that in these areas women are already very active and innovative in order to secure the survival of their families and communities. Women are the main collectors and suppliers of water for all domestic purposes. Even when the water is scarce due to drought, women are forced to walk long distances to fetch water. As water is most important for life, it must be available no matter where to get it. When water is not available at home, women are blamed.
SUGGESTED METHOD		Structured learning exercise: Film show or Group activity Exercise - 1: Direct and indirect risks of climate change and their potential effect on women
RESOURCES Supplies and Equipment Visual Aids Handout		White Board, and Marker, LCD Projector, Computer, Power point presentations Module 9 Contents

MODULE 9

Climate Change and Gender

TRAINERS GUIDE

TOPICS FOR DISCUSSION

Climate Change has significant bearing with Gender and there is a need to find out the causal interrelationship between climate change and gender. Module 9 elucidates the concepts of gender, gender dimensions of climate change, gender-based disparities towards the unequal exposure and vulnerability of women to climate change and role of women as key agents of change in responses to climate change.

MODULE CONTENTS

Gender - related concepts and definitions

Gender:

The term "gender" refers to socially ascribed roles, responsibilities and opportunities associated with women and men, as well as the hidden power structures that govern relationships between them. Gender is a term used to emphasize that sex inequality is not caused by the anatomic and physiological differences that characterize men and women, but rather by the unequal and inequitable treatment socially accorded to them. In this sense, gender alludes to the cultural, social, economic and political conditions that are the basis of certain standards, values and behavioural patterns related to genders and their relationship.

Despite recent advances, it still remains the case that in most societies there are significant differences between the rights and opportunities of women and men. These include, among others, differences in relation to land and resource rights, possibilities for advancement at work, salaries and opportunities to participate in and influence decision-making processes. The reality is that inequality between men and women is ingrained in social norms and values around the world.

Gender division of labour concerns the allocation of the tasks and responsibilities of men and women at home, at work and in society according to patterns of work that are felt to be acceptable in a particular place and time.

Gender equality refers to equal rights, voice, responsibilities and opportunities for men and women in society, at work and in the home. Gender equity refers to fairness between men and women in access to society's resources, including socially valued goods, rewards and opportunities.

Gender mainstreaming refers to the consideration of gender equality concerns in all policy, programme, administrative and financial activities, and in organizational procedures, thereby contributing to organizational transformation.

Gendered access to resources, facilities, services, funds, benefits and decision making refers to the differences between men's and women's rights and opportunities to make use of these resources and to take part in decision making, due to norms and values existing in a particular place and time.

Gendered control over resources and decision-making processes refers to differences between

women's and men's rights and power to decide on the use of resources, gain benefits, and take part in decision-making processes, due to norms and values existing in society.

Sex refers to the biological nature of being male or female. The biological characteristics of men and women are universal and obvious. Sex roles are those that are bound to one particular sex due to biological factors, for example, giving birth.

Women's empowerment refers to the process in which women reflect upon their reality and question the reasons for their situation in society. It includes developing alternative options and taking opportunities to address existing inequalities. It enables them to live their lives in the fullness of their capabilities and their own choices in respect of their rights as human beings. In the Beijing Declaration, it was agreed that "women's empowerment and their full participation on the basis of equality in all spheres of society, including participation in the decision-making process and access to power, are fundamental for the achievement of equality, development and peace."

A. WHAT IS THE GENDER DIMENSION OF CLIMATE CHANGE?

Climate change is increasingly being recognized as a global crisis, but responses to it have so far been overly focused on scientific and economic solutions, rather than on the human and gender dimensions. As weather patterns become increasingly unpredictable and extreme events such as cyclones, floods, droughts, salinity intrusion become more common, the poorest women and men - who have contributed the least to the problem - find their livelihoods most threatened yet have the weakest voice and least influence on climate policy.

Gender inequalities intersect with climate risks and vulnerabilities. Women's historic disadvantages - their limited access to resources, restricted rights, and a muted voice in shaping decisions - make them highly vulnerable to climate change. The nature of that vulnerability varies widely, cautioning against generalization. But climate change is likely to magnify existing patterns of gender disadvantage (UNDP Human Development Report, 2007). It is acknowledged that:

- There is a causal interrelationship between climate change and gender: (1) climate change tends to exacerbate existing gender inequalities; (2) gender inequalities lead women to face larger negative impacts;
- Women are not just victims but active agents of change and possess unique knowledge and skills;
- Understanding the risks and different impacts of climate change on men and women is key in achieving sustainable development and the MDGs.

It is understood that impact of climate change will be distributed differently among regions, generations, age, classes, income groups, occupations and genders. The poor, the majority of whom are women living in developing countries, will be disproportionately affected. Yet most of the debate on climate so far has been gender-blind.

Because climate change affects women and men differently, a gender equality perspective is essential when discussing policy development, decision making, and strategies for mitigation and adaptation. Women are not just helpless victims - they are powerful agents of change, and their leadership is critical. Women can help or hinder strategies related to energy use, deforestation, population, economic growth, science and technology, and policy making, among other things.

B. WHAT ARE THE GENDER-BASED DISPARITIES CONTRIBUTING TOWARDS THE UNEQUAL EXPOSURE AND VULNERABILITY OF WOMEN TO THE EFFECTS OF CLIMATE CHANGE?

Climate change and gender inequalities are in extricably linked. By exacerbating inequality overall, climate change slows progress toward gender equality and thus impedes efforts to achieve wider goals like poverty reduction and sustainable development. Gender inequality can worsen the impacts of climate change; meanwhile, taking steps to narrow the gender gap and empower women can help reduce these impacts.

1. CAUSES OF VULNERABILITY, OR SPECIFIC CONDITIONS THAT MAKE WOMEN, ESPECIALLY POOR WOMEN, VULNERABLE TO CLIMATE CHANGE

Vulnerability is a reflection of the state of the individual and collective physical, social, economic and environmental conditions at hand. These individual and collective conditions are shaped by many factors, among which gender plays a key role. Gender-based vulnerability does not derive from a single factor, but reflects historically and culturally specific patterns of relations in social institutions, culture, and personal lives. Gender relations will shape the above-mentioned four conditions of vulnerability. The intersection of these factors with caste, racial and other inequalities creates hazardous social conditions that place different groups of women at risk.

However, there is a need to avoid being simplistic and just seeing women (because of their sex) as victims. Women are not vulnerable because they are "naturally weaker": women and men face different vulnerabilities due to their different social roles. For example, many women live in conditions of social exclusion. This is expressed in facts as simple as differentials in the capacity to run or swim, or constraints on their mobility, and behavioural restrictions, that hinder their ability to re-locate without their husband's, father's or brother's consent.

It has also been found that the vulnerability and capacity of a social group to adapt or change depends greatly on their assets. Next to their physical location, women's assets such as resources and land, knowledge, technology, power, decision-making potential, education, health care and food have been identified as determinant factors of vulnerability and adaptive capacity. As discussed many times that the more assets people have, the less vulnerable they are and the greater the erosion of people's assets, the greater their insecurity. Data from around the world indicates that women tend to have less or limited access to assets (physical, financial, human, social and natural capital). Women's assets largely determine how they will be affected by and respond to the impacts of climate change. Therefore, actions should be taken to build up the asset base of women as a fundamental principle in adaptation strategies.

2. ADDED RISK IN SECURING WELLBEING

Climate change can have disproportionate impacts on women's wellbeing compared to men. Through both direct and indirect risks, it can affect their livelihood opportunities, the time they have available to them on a daily basis, and overall life expectancy. In addition to exacerbating existing risks, climate change can reveal new risks that have been hidden. A 2007 study by the London School of Economics, the University of Essex and the Max-Planck Institute of Economics analyzed disaster events in 141 countries and found that when women's economic and social rights are not protected, more women than men die from disasters. In societies where both genders enjoy equal rights, disasters kill similar numbers of women and men.

Bangladesh is considered as one of the most vulnerable places to natural disasters in the world due to its

geographic, demographic and socioeconomic position. Cyclone, storm surge, flood, river bank erosion etc., are not a sudden phenomenon here. These are very regular and common events especially to the coastal and char people of Bangladesh. In recent days it is observed that in Bangladesh total number of casualties due to natural disaster is gradually decreasing. Still then, women and children are most at risk of these undesirable events. Women and girls are severely marginalized all over Bangladesh, but the problems get much more magnified in coastal and char areas where life is more challenging, hard and conservative. Women of these areas are practically house-bound and hardly participate with men outside their families. In the social context of Bangladesh, men are the heads of the families and take all responsibilities in community matters. But this leaves women disempowered and extremely vulnerable because they do not have available information unless men share with them.

Because of the socio-cultural context of Bangladesh women become vulnerable in many ways. Women usually have to get clear approval from their husbands to go out of their homes for any purpose. Without husbands' permission they do not have the right or social ability to move towards safe shelter centre leaving their homes even during disaster. It has been observed that various types of domestic violence grow during and after natural disasters. As men lose their minimum income opportunities in such times left with little or no financial ability to run their families, emotional imbalance on their part sometimes leads to family violence. Displacement after disaster export women to violence and has assessment in the public space.

Hence interventions related to risk reduction and social risk management should pay especial attention to the need to enhance the capacity of women to manage climate change risks with a view to reducing their vulnerability and maintaining or increasing their opportunities for development. Some possible actions are:

- To improve access to skills, education and knowledge;
- To improve disaster preparedness and management;
- To support women in developing a voice and political capital to demand access to risk management instruments; and
- To develop policies to help households to stabilize consumption (credit, access to markets, social security mechanisms).

C. WHAT IS THE ROLE OF WOMEN IN CLIMATE CHANGE ADAPTATION?

Integrating considerations of gender into medium and long-term adaptation can help to ensure that adaptation is effective and implementable on the ground. It can help to ensure that the implementation of adaptation activities will not exacerbate inequalities and other vulnerabilities, it can help to fulfil the specific needs of the most vulnerable, and it can ensure the equal participation of men and women in the decision-making and implementation phases of these activities. Women can act as agents of change at different levels of the adaptation process.

Due to the dynamics and diversity of the risk associated with climate change, it is recognized that only with local participation and management it is possible to have awareness, knowledge and incentives for risk reduction and control. At this level, vulnerable women have played an outstanding role. Reports show that women have been capable of mobilizing the community in the different phases of the risk-management cycle and also in the adaptation context. Generally, women seek solutions to the lack of drinking water, access to health and education, reducing factors of vulnerability of their communities in the face of hydro-meteorological events associated with climate change and other potential hazards,

establishing networks with other women that increase their social capital. In their professional development or in their domestic activities, women are often in a better position to note certain environmental hazards.

At local levels, women who have greater clarity about what diverse social groups lose in the short term after a cyclone or an earthquake, who in the community are at risk and what is needed, and which native trees should be protected. They develop a broad knowledge and experiences regarding their environment, which are being evaluated constantly and changed when the environmental and social conditions of their surroundings vary. This knowledge is proving to be ever more valuable in developing countries (like Bangladesh) and should be taken into account in the adaptation of vulnerable communities to climate change.

Climate change impacts are already touching the lives of poor people all around the world, especially in developing countries. In Bangladesh, women are not only victims of climate change; they are also effective agents of change in relation to adaptation, mitigation and disaster reduction strategies. Their responsibilities in households and communities as guardians of natural resources have prepared them well for livelihood strategies adapted to changing environmental realities. Given their roles in society, (concerning production and reproduction within their family and community) women have important knowledge, skills and experiences for shaping the adaptation process and the search for better and safer communities. Among the major roles and responsibilities performed by women, reproduction and production as well as taking care of children, elderly, sick, injured and others are greatly challenging roles. Despite the challenges, especially when resources are scarce and food is limited, women are still fulfilling their principal roles and they have actively shown their concerns and potential talents in doing so. The talents, capabilities, knowledge, skills and experiences women possess in handling these two main functions can be translated into actions for climate change adaptation to reduce negative impacts and hence strengthen households' livelihoods. In the rural areas of Bangladesh, people's livelihood depend on agriculture and a large number of women are engaged in agricultural production while facing high risks of loss from droughts, uncertain rainfall, deforestation and salinity. Climate change adds to water insecurity and shortage, which ead to an increase of women's time to fetch water for domestic use. Traditionally, in the rural communities of Bangladesh, when talking about gender roles, the majority perceives women as powerless and vulnerable. They always need to be under men's power. However, reality shows that women are not just like that.

Adaptation involves a range of activities to reduce vulnerability and build resilience. The key sectors concerning women's activities to adapt to climate change are Agriculture, Water, Food Security, Forests, Health and the Economy. Traditionally, women have been working and are still assuming their responsibilities in these sectors in most communities, so one needs to underline, that in these areas women are already very active and innovative in order to secure the survival of their families and communities.

Agriculture

Although agriculture is facing lots of climate hazards, rural people still depend on it to earn their livelihoods. Agriculture is the mainstay for most of rural households in Bangladesh. Women, however, contribute to produce the food needed for the family. In detail, the role of women to produce and successfully harvest includes:

- Land preparation, seed sowing and transplanting

- Undertake tillage operation, other management activities
- Harvesting and post-harvest activities
- Seed processing and preservation
- Preparation and utilization of compost and farm yard manure.
- Plant trees around the farms, homesteads
- Kitchen gardening
- Rearing domestic animals etc.

These tasks can be performed by all people in families but women are in the front line in doing and advocating implementation. Even after harvesting, women are responsible for making sure they select and save seeds for the coming season.

Food Security

Women in most communities have the responsibility to care for the household's food security including the production, collection and storage of food. This means, it is important that women know the food requirement for the family in a week, a month, as well as a year. Consequently, women are preparing, processing and storing vegetables and fruits during the growing season in order to use them in the dry season when vegetables and fruits are not available. Processing these vegetables and fruits is easy by the use of local knowledge. The storage of surplus is an effective risk averting measure that woman can undertake against future livelihood failures.

Forest

Since firewood collection is the responsibility of women in most communities, women have been at the forefront of initiating tree nurseries and planting activities around their homes and in farms in order to restore the loss of trees being cut for firewood and charcoal making. Moreover, women have been constructing and using fuel saving stoves in cooking to reduce the demand of firewood.

Water

Women are the main collectors and suppliers of water for all domestic purposes. Even when the water is scarce due to drought, women are forced to walk long distances to fetch water. As water is most important for life, it must be available no matter where to get it. When water is not available at home, women are blamed. To ensure continuous and available water supply, women have joined hands and voice their concerns to the government and NGOs asking for the construction of deep tube-wells, tanks and rain water harvesting systems.

Health

Climate hazards have brought several serious diseases attacking people in communities. For instance, due to climate change and global warming, there has been increased incidence of salinity intrusion in many areas. This causes different types of diseases like pre-eclampsia in pregnant women. Out for seals of diarrhea are also common after cyclones and floods. Taking care of the sick people in the family is again the responsibility of the women. Sometimes, they are responsible with no resources to support them. In adapting to such situations, rural women have been reverting to the use of low cost traditional medicines and indigenous knowledge and health care.

Economy

Despite their major role in production for the household, women are known to have a low income in all communities. Traditions and culture have impeded them from engaging in economic activities. As women cannot bypass such tasks, they have responded by engaging more pro-actively in initiating and running small economic activities such as keeping and sale of livestock (poultry, piggery, goat, pigeon, dairy etc.), growing and sale of surplus horticultural and vegetable crops particularly during the dry season, mushroom production and fishing etc. They sometimes operate small businesses and income generating activities from their home and contribute to the family income and support the family as required.

Women are engaged in more climate change related activities than what is reported, documented or recognized by the public. At the same time, the effects of climate change are significantly impacting on poor people, particularly women. Climate change is exacerbating the problems and inequities that women are already facing. Women's livelihoods are highly dependent on natural resources which are heavily threatened by climate change. We have seen that women in most households in rural areas have the major responsibility for collecting and storing food, fuel for cooking and heating, and collection of water for all domestic use. When weather patterns are erratic, women spend more time on each of these tasks, which means, less time is spent on education, development work, health etc. Therefore, there is a need to strengthen women's ability to contribute and exercise their unique and valuable perspectives and expertise on climate change.

UNFCCC and Gender

On June 7, during the UN Climate Change Conference June 2013 (SB 38), UN Women, MRFCJ, GGCA, UNFCCC secretariat organized a side event on promoting gender balance and the empowerment of women in the UNFCCC process. This lunchtime event brought together Parties, observers, UN System entities, experts, civil society representatives and other stakeholders who shared insights and discussed efforts to strengthen gender balance, enhance the empowerment of women in the UNFCCC process, and advance gender-sensitive climate policy. The event also marked the launch of a desk research conducted by UN Women and MRFCJ on "Advancing the goal of gender balance in multilateral and intergovernmental processes".

At its eighteenth session, the COP adopted a decision on promoting gender balance and improving the participation of women in UNFCCC negotiations and in the representation of Parties in bodies established pursuant to the Convention or the Kyoto Protocol. The decision 23/CP.18 can be found in the COP 18 report.

COP 18 requested Parties and observer organizations to submit to the secretariat their views on options and ways to advance the goal of gender balance in bodies established pursuant to the Convention and the Kyoto Protocol, in order to improve women's participation and inform more effective climate change policy that addresses the needs of women and men equally (para 2 and 11 of decision 23/CP.18).

Since COP 18 in Doha, the UNFCCC secretariat has been tracking gender balance in UNFCCC constituted bodies and at relevant meetings. The data is being compiled and will be available via this webpage in the second quarter of 2013.

SUGGESTED READING

United Nations Development Programme (UNDP) (2007) Human Development Report 2007/2008.

Fighting climate change: Human solidarity in a divided world, New York: UNDP

Summary this is the correct way to give the links:
http://hdr.undp.org/en/media/HDR_20072008_Summary_English.pdf

Complete report: http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf

Lambrou, Y and Piana (2006) Gender: The Mission Component of the Response to Climate Change, Food Agriculture Organization of the United Nations (FAO).

Ahmad, N (2012) Gender and Climate Change in Bangladesh, The Role of Institutions in Reducing Gender Gaps in Adaptation Program, The World Bank

Skinner, E. (2011) 'Gender and Climate Change: Overview Report', BRIDGE Cutting Edge Pack,

Brighton: BRIDGE/Institute of Development Studies (IDS)

Dankelman, I. (2010) Gender and Climate Change: An Introduction, London: Earthscan

Brody, A., Demetriades, J. and Esplen, E. (2008) BRIDGE Occasional paper: Gender and Climate

Change: Mapping the Linkages - A Scoping Study on Knowledge and Gaps, Brighton: BRIDGE/IDS http://www.bridge.ids.ac.uk/reports/Climate_Change_DFID.pdf Summary adapted from the paper

Exercise 1:

Direct and indirect risks of climate change and their potential effect on women

Climate Change Effects	Potential Risks	Examplesof effect, impacts	Potential Effects On Women
	Increased temperature	Children and elderly health problem, heat stroke, problems at house and work place	
Direct	Increased air and sea temperature	Damages of coastal forests; loss of sea food varieties; damages of shrimp cultivation	
	Increased drought and water shortage	Damage of crops; scarcity of drinking water; failure of irrigation	
	Increased Salinity	Damage of crops, forest, fish; contaminate drinking water	
	Increased extreme weather events	Greater intensity and quality of cyclones, tidal surge, flood and water logging	
Indirect	Increased epidemics	Climate variability played a crucial role in recent cholera series in Bangladesh	
	Decreased crop production	Climate change could reduce wheat yield by 22%	
	Increased domestic violence	Violence increased in a disaster situation, in flood/cyclone shelters	

Table 9.1

MODULE 10

CLIMATE SMART DEVELOPMENT

CLIMATE SMART DEVELOPMENT

MODULE 10

OVERVIEW OF MODULE

DURATION		Training Course: 90 minutes
OBJECTIVES		At the end of the Module 10, the participants will learn and be able to explain 1. What is "climate smart" development? 2. Is your organization climate smart? 3. Steps/actions to enable a "climate smart" organization
COVERAGE		A. What we mean by "climate smart" development. Elements and characteristics of "climate smart" development, where it involves: • Applying the climate lens • The four step approach to integrating adaptation • Planning for climate change actions B. The state of climate smartness in the organizations where the participants work. How to assess your organizations' climate smartness, with practical examples in both adaptation and mitigation actions, C. Areas and actions on ways to strengthen organization capability toward climate smart development drawing on practical examples from experience,
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT IS "CLIMATE SMART" DEVELOPMENT?

DURATION		Training Course: 10 minutes
OBJECTIVES		At the end of the session, participants will be able to explain what is Climate Smart Development
KEY POINTS		Climate smart is a concept which has become a buzz word in recent decades. Originating in industrialized developed countries who also are major polluters of greenhouse gases, Climate Smart has gained much popularity and acceptance as it embraces a change in the way we develop, in our lifestyles and aspirations. Climate smart development is development that considers climate risks and takes measures to address them. In the context of Bangladesh, a country historically prone to climatic hazards climate change will further compound and increase climate impacts of significant consequences. Climate smart development is a culture or a process aiming to protect past development gains, as well as reduce risks of future investment in achieving development goals and people's aspirations.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 9 Contents

B. IS YOUR ORGANIZATION CLIMATE SMART?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain if their organization is climate smart
KEY POINTS		One way to find out how Climate Smart you or your organizations are to compare the mitigation, adaptation and institutional potential of individual, family, communities, organizations, etc., with that of their actual performances and practices. In the context of adaptation to climate change, becoming Climate Smart will depending on your vulnerability, exposure, sensitivity to climate change impacts and risks as well as your present capacity and potential. In Bangladesh for example, at personal level a farmer may be considered being Climate Smart if knowledge and understanding of climate risks inform him making decisions and choices that safeguard his production targets. It is therefore useful to assess capacity as well as potential of each government organization and chart conscious actions toward becoming Climate Smart.
SUGGESTED METHOD		Exercise Participants reflection on the exercise Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 9 Contents

C. STEPS/ACTIONS TO ENABLE A "CLIMATE SMART" ORGANIZATION

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain steps and actions to enable climate smart organizations.
KEY POINTS		From mitigation perspective, a business or government organization may consider to fulfill commitment to be climate smart with conscious actions in 1. Reducing organizations' total greenhouse gas emissions 2. Reducing electricity use in facilities per square meter 3. Sourcing at least 50 percent of electricity from renewable sources 4. Choosing and promote environmentally-conscious transport 5. Promoting energy efficiency among staff, users, stakeholders From an adaptation perspective, becoming Climate Smart could be interpreted as taking conscious actions to adapt and reduce climate risks in all activities and processes, all investment and assets, etc. This should take place at all levels, horizontal and vertical. Climate Proofing is an integral part of becoming a Climate Smart Organization or individual. The following step of actions may be useful for any organization scoping to embark on a journey toward "Climate Smartness". 1. Assessing Vulnerability 2. Identifying Adaptation Options 3. Selecting Adaptation Measure 4. Developing a Monitoring and Evaluation Framework 5. Developing Institutional Capacity to Adapt
SUGGESTED METHOD		Group activity Participants reflection on the exercise Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 9 Contents

MODULE 10

CLIMATE SMART DEVELOPMENT

TRAINERS GUIDE

TOPICS DISCUSSED

Government Officers must prepare themselves and their organizations to respond effectively to climate risks and vulnerability to impacts. Module 10 discusses elements and characteristics of "climate smart" development, "climate smart" organization and steps and actions to enable "climate smart" organizations/ development.

MODULE CONTENTS

This Module aims to introduce key concepts, methods and practical ideas in planning and achieving success in transforming an Organization from a "business as usual" culture and mandate in development decision making and implementation, toward a climate smart organization conscious of the climate impacts, risks and challenges and develops and implement actions and decisions on the basis of informed and systematic analysis.

The Module builds on discussion addressing three topics or learning areas. The first of this is what we mean by climate smart development. The second questions the state of climate smartness in the organizations where the participants work. Finally, areas and actions are discussed drawing on some practical examples from experience, on ways to strengthen organization capability toward climate smart development.

A. WHAT DO WE MEAN BY CLIMATE SMART?

Climate smart is a concept which has become a buzz word in recent decades. Originating in developed countries who also are major polluters of greenhouse gases, Climate Smart has gained much popularity and acceptance as it embraces a change in the way we develop, in our lifestyles and aspirations.

Climate smart individuals, families, communities, organizations, businesses all have one thing in common. Each is role models in his domain, practically demonstrating their effort and commitment to realize their potential for mitigation, adaptation and institutional arrangement, and participate in response to climate change process. As agents of response to climate change, they lead responsibly from the front showing others that if there is will there are ways.

WHAT IS "CLIMATE SMART" DEVELOPMENT

Climate smart development is development that considers climate risks and takes measures to address them. In the context of Bangladesh, a country historically prone to climatic hazards climate change will further compound and increase climate impacts of significant consequences. Climate smart development is a culture or a process aiming to protect past development gains, as well as reduce risks of future investment in achieving development goals and people's aspirations. Every individual, organization and community can reflect on their role and responsibility to be able to contribute toward a climate smart development process. This reflection can take place in many ways. Government officers and professionals are active servicing national development process, discharging mandated responsibility at agency, department, ministry and other administrative levels. An understanding of key elements, principles.

"Climate Smart" development involves

I. APPLYING THE CLIMATE LENS
II. THE FOUR STEP APPROACH TO INTEGRATING ADAPTATION
III. PLANNING FOR CLIMATE CHANGE ACTIONS

I. APPLYING THE CLIMATE LENS
- Identify Climate Change Risks (Background to climate change concepts, factors and impacts; Bangladesh Climate Change Scenario and projections, stressing the value of adaptation; Exercise identifying how climate change affects the development process)
- Scope National and Local Level Policies on Climate Change (The mandate of organization links to Bangladesh Legal Framework; Establishing such relations strengthen adaptation initiatives)
- Pinpoint Current and Future Risks associated with Climate Change (Highlights the importance and relevance of climate data in decision-making)

II. THE FOUR STEP APPROACH TO INTEGRATING ADAPTATION
- Assess Vulnerability (Systematic approach to climate change adaptation; Analyze the vulnerability of the system of interest to identify action points; These can then be used as basis to formulate solutions)
- Integrate Adaptation Measures into the development process
- Evaluate plausible options, based on established criteria, ranked according to priority
- Formulate elements of a Monitoring and Evaluation Framework

III. PLANNING FOR CLIMATE CHANGE ACTIONS
- Institutional Capacity Requirements in Implementing Adaptation
- Options as a continuous change process
- Pinpoint Key Steps to integrating Adaptation and linkages among stakeholders at local, regional and national levels

B. HOW CLIMATE SMART IS YOUR ORGANIZATION?

One way to find out how Climate Smart you or your organization are is to compare the mitigation, adaptation and institutional potential of individual, family, communities, organizations, etc., with that of their actual performances and practices.

This assessment should include mitigation potential (how much is spend on energy, how much energy is used/consumed and where (electricity, transport) over say a month or annually, etc. There may be opportunities for mitigation from afforestation and avoided deforestation, energy efficient facility and products and services.

As an example, increasing efficiency in energy use by changing practices or replacing technology and appliances are areas where efforts can deliver rich dividends. A related concept gaining much popularity in recent times is the Carbon Footprint. This measures how much greenhouse gas emissions you or your organization releases into the atmosphere in say one year.

However, as adaptation gained recognition as the response to climate change to manage what is unavoidable in decades to come Climate Smart was seen to be applied in the context of reducing vulnerability from adverse impacts, increasing adaptive capacity, managing climate risks, etc. as well.

In the context of adaptation to climate change, becoming Climate Smart will depend on your vulnerability, exposure, sensitivity to climate change impacts and risks as well as your present capacity and potential. In Bangladesh for example, at personal level a farmer may consider being Climate Smart if knowledge and understanding of climate risks inform him making decisions and choices that safeguard his production targets. It is therefore useful to assess capacity as well as potential of each government organization and chart conscious actions toward becoming Climate Smart.

The culture of the organization and staff considering climate smart activities may be proactive or reactive to changes. However, more opportunities as well as potential to become more climate smart remain hidden or dormant in such organizations.

C. WHAT YOUR ORGANIZATION CAN DO TO BECOME CLIMATE SMART?

A wise and practical start would be recognizing to be a part of the problem as well a part of the solution to climate change.

Climate change is one of the major challenges of our time. All individuals and organizations must take keen interest in tackling this - and have a responsibility to do so.

To sustain development or business goals and targets, energy use and transport are unavoidable. Everyone should work hard to be as energy efficient as possible. And for the energy use we cannot avoid, we should ultimately strive to use renewable energy only. Our goal should be to reduce our operations' total emissions - despite continued growth each year.

We also should use our influence to encourage action on climate. This includes working with all stakeholders and collaborative initiatives to improve their energy efficiency and overall environmental performance.

Be climate smart - Conscious Actions

From mitigation perspective, a business or government organization may consider to fulfill commitment to be climate smart with conscious actions in

1. Reducing organizations' total greenhouse gas emissions
2. Reducing electricity use in facilities per square meter
3. Sourcing at least 50 percent of electricity from renewable sources
4. Choosing and promote environmentally-conscious transport
5. Promoting energy efficiency among staff, users, stakeholders

From an adaptation perspective, becoming Climate Smart could be interpreted as taking conscious actions to adapt and reduce climate risks in all activities and processes, all investment and assets, etc. This should take place at all levels, horizontal and vertical. Climate Proofing is an integral part of becoming a Climate Smart Organization or individual. The following step of actions may be useful for any organization scoping to embark on a journey toward Climate Smartness.

1. Assessing Vulnerability
2. Identifying Adaptation Options
3. Selecting Adaptation Measure
4. Developing a Monitoring and Evaluation Framework
5. Developing Institutional Capacity to adapt.

MODULE 11

MAKING PLANS AND PROJECTS CLIMATE RESILIENT

MODULE 11

MAKING PLANS AND PROJECTS CLIMATE RESILIENT

OVERVIEW OF MODULE

DURATION		Training Course: 120 minutes
OBJECTIVES		At the end of the Module 11, the participants will learn and be able to explain 1. What climate resilience is about 2. Principles of Climate Resilient Development 3. Steps in Climate Resilient Development
COVERAGE		A. Definition and concept of climate resilience; objective of climate resilient development; climate change exposure and stimuli B. The three key principles of making plans and projects climate resilient, C. Steps • Preparation • Analysis • Options for Action • Integration
SUGGESTED METHOD		Discussion and Presentation Exercise
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

SESSION GUIDE

A. WHAT IS CLIMATE RESILIENCE?

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain what we mean by climate resilience
KEY POINTS		What is Climate Resilience? Resilience to climate change is the ability of a system, community or society exposed to hazards resulting from climate change to prepare for, absorb, accommodate to and recover from the effects of a hazard. Climate Resilient Development is a tool to undertake systematic analysis of climate risks and vulnerabilities for incorporation of measures to reduce risks and increase adaptive capacity. Focusing on the development of climate-smart development plans, programs and projects, it seeks to answer questions like: • Are development goals in planning and projects achievable considering changing climate as a constraint? Is there any need for adjustments? • Are investments threatened by climate change? Climate Resilient Development is a tool that facilitates analysis of policies, projects and programs in relation to risks and opportunities posed by climate change; it helps identify measures required to address such changes. The tool is made up of specific steps and can be used at national, sectoral, project and local levels. It has a flexible approach that can be adapted to different contexts.
SUGGESTED METHOD		Group activity Participants reflection on the exercise Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Documentary Film Module 10 Contents

B. PRINCIPLES OF MAKING PLANS AND PROJECTS CLIMATE RESILIENT

DURATION		Training Course: 30 minutes
OBJECTIVES		At the end of the session, participants will be able to explain the principles of Climate Resilient Development
KEY POINTS		Climate Resilient Development builds on three principles: 1. Process is Key: Climate Resilient Development requires institutions and their staff to change familiar procedures and modes of planning. These changes require time and sensitive process facilitation. Climate Resilient Development follows a stepwise approach which values and recognizes the different interests, needs, and positions of the stakeholders involved. 2. Form follows function: Climate Resilient Development is flexible. The approach is adapted to each specific context, to socio-economic and political conditions, as well as to the existing institutional framework. 3. Mix of perspectives: In order to make Climate Resilient Development a success, different perspectives are needed to enrich the process.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 10 Contents

C. METHODS FOR MAKING PLANS AND PROJECTS CLIMATE RESILIENT

DURATION		Training Course: 60 minutes
OBJECTIVES		At the end of the session, participants will be able to explain methods for making plans and projects climate resilient
KEY POINTS		The Climate Resilient Development approach contains four main steps. Step 1: Preparation: In step 1, the ground is prepared for using Climate Resilient Development in an efficient and highly beneficial way. In order to facilitate more effective, climate resilient planning, climate information on current and anticipated future climatic trends has to be gathered and compiled in a user-friendly way. Step 2: Analysis: In step 2, stakeholders and experts conduct a clear-sighted analysis of the biophysical and socio-economic effects of climatic trends on each exposure unit and develop probable chains of effects for climate change. Step 3: Options for Action: For the most significant effects defined previously, options for action are developed to reduce the effects of climate change and to make use of the opportunities presented by climate change wherever possible. Step 4: Integration: This step aims to integrate the selected options for action into planning documents and the monitoring and evaluation processes.
SUGGESTED METHOD		Presentation and Discussion
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Module 10 Contents

MODULE 11

MAKING PLANS AND PROJECTS CLIMATE RESILIENT

TRAINERS GUID

TOPICS FOR DISCUSSION

Climate Resilient Development is a tool to undertake systematic analysis of climate risks and vulnerabilities for incorporation of measures to reduce risks and increase adaptive capacity. Module 11 discusses the concept, principles and approaches for Climate Resilient Development. The method and process to make plans and projects climate resilient are also explained. Useful tips are discussed which can ensure successful results.

MODULE CONTENTS

A. WHAT IS CLIMATE RESILIENCE?

What is Climate Resilience? Resilience to climate change is the ability of a system, community or society exposed to hazards resulting from climate change to prepare for, absorb, accommodate to and recover from the effects of a hazard, including through the preservation and restoration of its essential basic structures and functions. Climate change makes more people vulnerable as a result of increased exposure and sensitivity, pushing at-risk populations beyond their capacity to cope with and adapt to changes they have traditionally been able to handle. Resilience does not imply the absence of such risks, but the ability to live with and manage them, including the ability to respond to shifting and unpredictable circumstances associated with climate change. Achieving resilience is a transformative process which builds on the innate strength of individuals, their communities and institutions to mitigate the impacts of shocks, and learn from experience.

Resilience is understood as a process in a continuum of stages, including ability for anticipation (proactive preparedness); ability to absorb or cope with a shock; ability to adapt, or incrementally adjust; ability to recover or "spring back" to a functional state (post-shock strategies); and ability to transform to a state less vulnerable to disturbance. In practical application, resilience strategies need to be crafted for specific groups, programs and policies and specific shocks and risks.

Project planners may consider a number of approaches, currently practiced in several countries, to integrate CCA consideration into development projects in different sectors. Climate Resilient Development is one such approach.

What is the Climate Resilient Development tool? Climate Resilient Development is a tool that facilitates analysis of policies, projects and programs in relation to risks and opportunities posed by climate change; it helps identify measures required to address such changes. The tool is used to undertake systematic analysis of climate risks and vulnerabilities for incorporation of measures to reduce risks and increase adaptive capacity, while at the same time ensuring that vulnerabilities are not inadvertently increased. It focuses on the development of climate-smart development plans, programs and projects and seeks to answer questions like:

- Are development goals in planning and projects achievable considering changing climate as a constraint? Is there any need for adjustments?

- Are investments threatened by climate change?

The tool is made up of several specific steps, and can be used at national, sectoral, project and local levels. It has a flexible approach that can be adapted to different contexts.

Climate Resilient Development is a process-based tool that can be adapted to a specific context. The tool builds on intensive collaboration with local stakeholders who have the motivation to lead the process and integrate the tool into the planning cycle. The involvement and commitment of relevant decision-makers is at the heart of successful climate resilient development.

A better understanding of climate resilience requires gathering information on climate trends and projections, and defining exposure units within the specific planning context.

Exposure units refer to a particular ecosystem (e.g. floodplain), a service sector (e.g. fisheries/livestock), administrative entities (e.g. local authorities) or other type of unit. After determining the climate stimuli's biophysical and socio-economic impacts on the exposure units, the risks that these impacts pose are then evaluated.

Options for action and practical integration of climate aspects are then developed. Determining which options should be prioritized requires coordination with supporting sectors. Priority is usually given to options that address high and medium risks. Planning for a worst possible case, with less likelihood of occurring, is by and large not financially feasible; it is crucial to include political and financial feasibility criteria, and cost benefit approximation. On the other hand, 'low regret' measures are considered value for money as they provide benefits - and often co-benefits - relative to comparably low costs.

Table 11.1 Exposure Units and Climate Stimuli

Category	*Exposure Unit*
Ecosystems services	Water resources Agriculture Forestry Biodiversity Fisheries Livestock
Human systems and services	Buildings and settlements Infrastructure and transport Industry and production Energy supply Services Tourism Health
Specific risk regions	Coastal zones Flood areas Dry regions Sunderbans

Category	**Trend**
Annual mean temperature	↗
Temparature in critical season	↑
Snnual precipitation	↘
Precipitation in critical season	↘
Annual water avilability	↘
Duration of vegetation period (drought/ rain season)	→
Extreme rainfalls	→
Sea level	↗
Flood	→
Hurricanes/typhoons	→
Heat waves	↗
Droughts	↗

OBJECTIVES of using the Climate Resilient Development Tool are

1. to improve institutional capacities to analyze and formulate development projects addressing climate change
2. to integrate adaptation measures into development projects

Climate Resilient Development considers using a climate lens, which is a systematic approach to incorporate and integrate into a plan or project. We need to consider how climate change will affect our project or plan. We will need to look at how the project or plan in question is exposed to climate change.

Climate Resilient Development is a means to negotiate an environment where risks are changing and often uncertain as a result of climate change. It offers a way to proactively manage such risks in a forward-looking manner and avoid decisions that can lead to irreversible negative outcomes if these risks are managed as only damage control reaction, or to mal-adaptation from unconsciousness of risks (Figure 11.1).

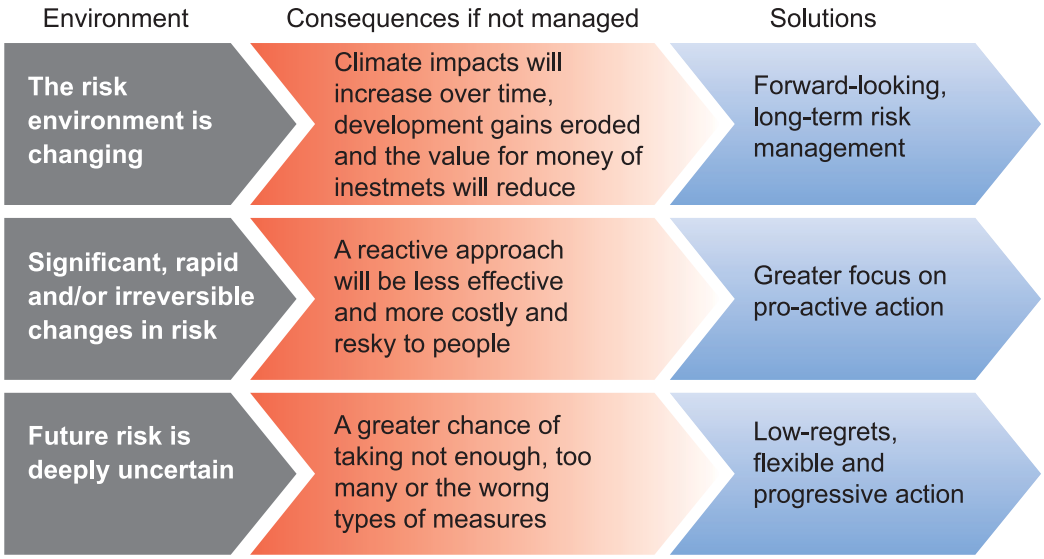


Figure 11.1: Challenges of a changing risk environment

Source: Based on Ranger and Garbett-Shiels (2012) and Fankhauser et al (2013)

B. PRINCIPLES OF MAKING PLANS AND PROJECTS CLIMATE RESILIENT

Climate Resilient Development builds on three principles. These are discussed briefly:

1. Process is Key: Climate Resilient Development requires institutions and their staff to change familiar procedures and modes of planning. These changes require time and sensitive process facilitation. Making plans and projects climate resilient follows a stepwise approach which values and recognizes the different interests, needs, and positions of the stakeholders involved. Strong leadership helps in implementing the envisaged changes, but Climate Resilience should not be imposed - it requires genuine ownership at local and sectoral levels. For example, work on climate change issues in sectoral policies should build on genuine interests of the sectors concerned regarding specific climate-related questions, rather than being imposed by environmental or cross-sector institutions. In addition, a sound communication strategy facilitates development of shared solutions among various stakeholders.

2. Form follows function: Climate Resilient Development is flexible. The approach is adapted to each specific context, to socio-economic and political conditions, as well as to the existing institutional framework. Other on-site conditions that have to be taken into account are available funds, prior experience with environmental tools, the extent of climate change awareness, and technical expertise. For instance, relevant decision makers and policy makers, development planners, climate change experts as well as representatives of the population affected by climate change should discuss the choice of options for action together. The use of Climate Resilient Development for national strategies will entail different stakeholders, terminology and levels of abstraction than the work with communities on Climate Resilient Development in for instance land use planning.

   While the tool itself is flexible, it is also of importance that ensuing projects and plans have in-built flexibility. It should be possible to adjust plans and strategies to a continuously changing risk landscape as the future climate evolves. Safety margins should be considered, in particular when additional costs are low.

3. Mix of perspectives: In order to make Climate Resilient Development a success, different perspectives are needed to enrich the process. Climate Resilient Development requires technical know-how, methodological expertise, and experience in process management. Action should be taken cautiously, and stakeholders should always be involved in meaningful cooperation settings. Knowledge of conditions on the ground should be brought together with climate change science and policy making expertise.

C. METHOD FOR MAKING PLANS AND PROJECTS CLIMATE RESILIENT

The method of making plans and projects climate resilient contains four main steps. These are also illustrated in Table 11.2. The steps can be extended or adapted individually according to the "form follows function" principle. The principles described in the previous chapter are taken into account in all the steps.

Table 11.2 Climate Resilient Development in Practice

Principles	Methodological Steps	Technical Capacity/Services
PROCESS IS KEY	Step 1 PREPARATION	Capacity development for climate information and Climate Resilient Development approach
FORM FOLLOWS FUNCTION	Step 2 ANALYSIS Step 3 OPTIONS FOR ACTION	Vulnerability and impact analysis Process Facilitation
MIX OF PERSPECTIVES	Step 4 INTEGRATION	Support for organizational development (e. g. procedures, institutions, human resources) Financial or technical support for implementation

Step 1: Preparation: In step 1, the ground is prepared for using Climate Resilient Development in an efficient and highly beneficial way. In order to facilitate more effective, climate resilient planning, climate information -especially on current and expected future climatic trends (e.g. sea level rise, reduced water availability, etc.) - has to be gathered and compiled in a user-friendly way. If no processed information is available, a desk study may be carried out to provide a data base. It has proven helpful to develop climate change factsheets to be used in the process and to identify three or four main trends.

Not all plans are affected by climate change. Based on the information gathered, climate change experts and planners, project managers and decision makers have to determine whether it is reasonable to engage in Climate Resilient Development in a specific context. When doing so, they can use questions listed in Table 11.3 as a guide.

Table 11.3 Examples of questions for local government plans to be subject to Climate Resilient Development

Key questions	Examples
Do climatic trends, such as increasing temperatures or sea level rise, potentially have an impact on planning? If so, specify.	Low impact Medium impact
Is the time horizon of the planning relevant to these climatic trends?	Short-term planning horizon – high relevance Long-term planning horizon – medium relevance
Does the planning refer to elements (exposure units) which are particularly affected by climate change (e.g. sectors, policy aspects, geographic area, specific target group, etc.)?	Agriculture Energy production policy Coastal zones Dry land regions Hilly regions Fishermen

The questions also help to identify those elements in the planning which are particularly affected by climate change. These so-called exposure units can include productive sectors (e.g. agriculture, fisheries, poultry and livestock), policy aspects (e.g. agriculture policy), geographic areas (e.g. coastal zones, drought prone areas) or a specific target group (e.g. farmers and fisher folk). The choice of the exposure units provides the basis for step 2.

From the "process is key" perspective, the integration of climate change issues into development planning needs an entry point along the project cycle. In the ideal case such an entry point is at the beginning of a planning phase. In certain cases where planning documents are not yet available or the planning is to be revised, other entry points have to be found, such as a mid-term evaluation. It is also necessary to identify stakeholders to take part in the process.

The participating stakeholders can usually be divided into two groups: first, stakeholders who act as "catalysts" for the change process, such as policy makers, managers in institutions, consultants and experts, and project managers; and second, stakeholders who will apply and implement Climate Resilient Development, such as development planners, climate change scientists, and project staff. These groups may overlap. External support may prove valuable for all the different stakeholders.

Step 2: Analysis: In step 2, stakeholders and experts conduct a clear-sighted analysis of the biophysical and socio-economic effects of climatic trends on each exposure unit and develop probable chains of effects for climate change. Biophysical effects relate to physical phenomena such as species migration in

ecosystems. Following the chain of effect, the bio-physical effects lead to socio-economic effects such as reduced employment opportunities or loss of income. The chains of effect are compiled in tables. (See Table 11.4)

Following this, the relevance of the effects for planning is assessed with regard to:

- the probability of the effects occurring,
- the impact of the effects on project objectives,
- the ability of institutions and groups to adapt to the changes without external support.

The most significant effects are identified on the basis of this evaluation. Steps 3 and 4 are carried out only for the most relevant effects. For instance, if the climate change effects identified entail only negligible risks for planning, these should be addressed at this stage. In many cases the project leader chooses five to seven main effects.

Table 11.4 Chain effect of climate change

Climatic trend	Exposure unit	Bio-physical effect	Socio-economic effect	Relevance for Planning	Options for Action

Step 3: Options for action: For the most significant effects defined previously, options for action are developed to reduce the effects of climate change and to make use of the opportunities presented by climate change wherever possible. This step is supported by sectoral support sheets which compile experiences of adaptation to climate change in specific sectors. For the choice of options, the respective Climate Resilient Development stakeholders take into account criteria such as the following (see Table 11.5).

Table 11.5 Criteria to Prioritize options for action, *Source: Vetter, A.; Schauser, I. (2010)*

Criteria	Description
Strategic relevance	The option for action particularly concerns severely affected, vulnerable regions/fields of action. The option for action has a reliable and long-term, goal-oriented effect (i.e. risk reduction). The option for action prevents irreversible damages.
Urgency	Climatic change is already occurring or will occur in the near future. Decisions about long-term investments and development paths are taken.
Side effect	The option for action supports or is consistent with the objectives of other activities (sustainability, biodiversity, climate protection). The option for action engenders positive effects on different fields of action (win-win solutions, in particular concerning climate protection and sustainability).
Low regrets	Positive effects will be generated both without changed climatic conditions as well as within different climate scenarios.
Flexibility	The option for action can be modified or further developed. The option for action can be reversed once conditions change.
Economic aspects	The medium or long-term benefit of the option is greater compared to its costs (including non-monetary aspects). The use of resources is efficient.
Political and social acceptance	The moment for implementing the option for action is favorable (“window of opportunity”).

Instruments such as cost-benefit analysis support the selection of options for action and are deployed according to the specific possibilities. Table 11.6 illustrates one technique which might facilitate this prioritization.

Table 11.6 Prioritization of Techniques

Criteria	**Scores for selected options for action (OA)** (1=very much; 5=not at all)		
	OA 1) (please specify)	OA 2) (please specify)	OA 3) (please specify)
Do the benefits from this option for action promote climate change adaptation?			
Compared to the benefits, are the additional costs reasonable?			
Taking into account the costs and benefits, are the required funds available to implement this option? If not, what additional funding is available?			
Would the benefits of this option for action also occur in the long-term?			
Is the planning horizon for the option for action in line with the planning horizon for climatic trends?			
Do the required technical skills to implement the option for action exist? If not, which skills have to be acquired?			
Total Score			
Rank			

In certain cases options for action provide additional development benefits such as new employment opportunities, the improvement of water availability and the enhancement of environmental health. These co-benefits are also taken into account. They present win-win situations, like for instance flood protection reducing hazard risks, supporting ecosystem stability and protecting livelihoods.

At the end of this step the options for action to be integrated are selected by the stakeholders on the basis of these criteria. In many cases a limited number of options (e.g. often three per category below) are identified and categorized:

- Actions at the start of the project
- Actions to be planned for the implementation period
- Adjustments to the objectives, indicators or the Monitoring and Evaluation system

Step 4: Integration: This step aims to integrate the selected options for action into planning documents and the monitoring and evaluation processes. The amendments depend very much on the level at which they are implemented. Accordingly, the Climate Resilient Development stakeholders define, adapt or redesign the respective planning, including planned policy or strategy formulations and/or national, sectoral, local or project development plans. The following key questions guide this integration:

- How can the option for action be integrated into the planning (e.g. by slightly modifying the activity)?
- Is it necessary to modify the original planning to integrate the option for action? If so, how?
- Which additional technical skills / funds are required to implement the option for action?

Some options for action to be integrated can be quite fundamental, such as choosing areas less prone to floods. In other cases, the integration will be about changing the way things are done or shifting priorities.

The Climate Resilient Development application does not end with the revision of planning. Adaptation to climate change is also subject to regular monitoring and evaluation procedures.

In order to apply Climate Resilient Development in an effective manner, different kinds of knowledge are required at different stages of the step-by-step approach. Each application demands different know-how. For instance, at the beginning of applying Climate Resilient Development, it is important that practitioners generate a degree of awareness about climate change and about ways of interpreting climate change information. At the end of the process, technical know-how might be of particular relevance in order to implement the adapted planning.

It is crucial to identify the expertise needed at different points during the process in order to seek the right kind of technical assistance support from development experts if needed.

Climate Resilient Development is a powerful tool at the project level as:

(1) Project goals may be directly affected by the effects of climate change, and
(2) Project results may increase or decrease the climate vulnerability of bio-physical and socio-economic systems.

Climate Resilient Development can be applied during project identification and during the project design phase. To ensure successful and sustained outcomes, the following suggestions may be considered:

Create a common understanding: Climate Resilient Development increases the efficiency and effectiveness as well as the sustainability of development planning by strengthening its robustness to climate change. It is crucial that all those involved in the process share an interest in acting to address climate change and have a common understanding of this overall goal.

Sometimes this common understanding is challenged in practice by the use of climate change terminology, which is sometimes difficult to understand, especially when terms are translated from one language into another. Terms such as "exposure unit" or "socio-economic effect" can be formulated differently according to the stakeholders involved. It can be very helpful to paraphrase the key words or even to develop a glossary in collaboration with the key team.

Identify the stakeholders: Users have found that one of the factors for success lies in government institutions and development partners carefully identifying the participating groups. Due to their important role in "leading" the development initiative to be climate resilient, decision makers and policy makers at the respective level of application should be involved in order to mainstream the approach in the planning process and to ensure political support. The "mix of perspectives" should include a broad spectrum of know-how such as climate change, organisational and management expertise, knowledge of the planning and the project context, knowledge of the local, regional or national environment, as well as communication skills.

Involve the stakeholders at the right moment: It is not necessary for all the participants who have been identified to take part in each step. Along with the "process is key" principle of Climate Resilient Development, for instance, scientific actors may play a more important role when it comes to collecting and working on climate information in steps 1 and 2; they become less crucial players in steps 3 and 4, although they should also participate at this stage as well. Policy makers and project managers are particularly important in each planning context, as they are the ones who can support the application of Climate Resilient Development in the medium and long term.

Handle climate change information appropriately: Climate Resilient Development requires climate change information such as climate data bases, impact or vulnerability assessments, local knowledge about climate change, and so on. This information has to be either collected or generated. Usually, scientifically based climate data have to be translated into "take-away messages" that can be understood by a broad

range of stakeholders in the process. When reducing the complexity of climate information data (such as those concerning causes and effects), it must be ensured that it is not oversimplified, as this might reduce the degree of acceptance and the overall effectiveness of the approach.

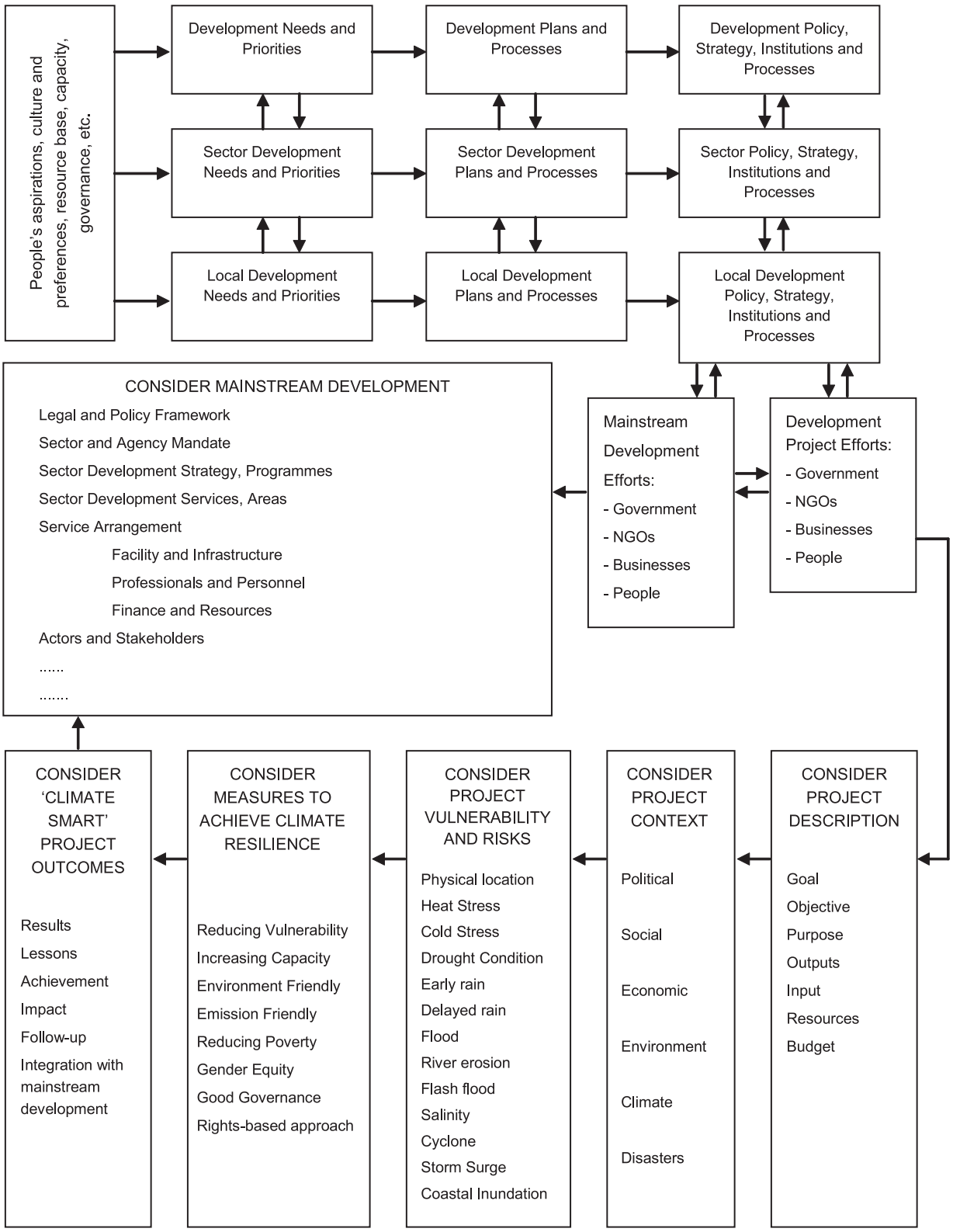
Find a good entry point: Climate Resilient Development should not be applied at any randomly chosen moment. Users confirm that plans already subject to implementation are difficult to adapt to include climate issues at very short notice. Ideally, climate resilience aspects will be taken into account during the initial drafting and planning of measures or during the re-orientation and updating of the planning phase.

Allocate adequate time and funding: A few weeks may be sufficient to successfully apply Climate Resilient Development in a single (pilot) case, but not to implement an adapted version of Climate Resilient Development in a given context. In order to allocate adequate time and funding, a distinction needs to be made between (1) conceptualizing the process, (2) applying the four-step approach, and (3) evaluating the application, including ongoing quality control (monitoring and evaluation). The time and funding needed for these tasks have to be estimated for each context of application. The preparatory phase and evaluation are of particular importance in order to mainstream the Climate Resilient Development approach into local policy or project structures.

Integrate the approach into monitoring and evaluation procedures: Climate Resilient Development is not a one-off activity and should be integrated into all planning, implementation and evaluation processes. Accordingly, users stress the importance of ensuring that planning adapted to climate change is part of existing quality control procedures, including monitoring and evaluation mechanisms. Moreover, as time progresses, we will learn more about the effectiveness of various measures to adapt to climate change, about vulnerability tipping points and about the future climate. Such information should be fed back in an iterative loop, which will help us to continuously refine strategies.

In conclusion, Climate Resilient Development

- Is an integrative, participatory and flexible approach: Climate Resilient Development is a participatory approach which draws strength from the mix of perspectives deployed. It provides an opportunity to engage a wide range of different stakeholders, from high-level decision makers to local populations such as farmers, in discussions about climate change. Even though the issue of climate change is not easy to deal with, the methodology is easy to understand and, following the "form follows function" principle, can be adapted to any context.
- Does not need computers or computer skills: The key steps of Climate Resilient Development can be performed successfully without applying information technology. This means that it is possible to include actors without computer skills. It can therefore be used globally, even by local actors. However, more sophisticated techniques can be integrated as well: for instance, modelling can be included in step 1.
- Enables strong ownership: Reflection on past experiences has shown that Climate Resilient Development achieves a high level of ownership by partners, as they realize how crucial climate change adaptation is for their future. The approach enables an open dialogue to take place between the key stakeholders at different levels: the population exposed to climate change, decision makers, development planners and climate change experts. Thus climate resilient development motivates people to take action.



Adapted from: Haque, N. (2013)

Figure 11.2 A Conceptual Framework from Needs and Priorities to Climate Resilient Outcomes

MODULE 12

ACTION PLANNING

ACTION PLANNING

MODULE 12

SESSION PLAN

DURATION		Training Course: 60 minutes
OBJECTIVES		At the end of the Module 12, the participants will learn and be able to conduct action planning exercise for adaptation to climate change
KEY POINTS		participants will engage in identifying opportunities and planning conscious actions over a timeline to chart out a roadmap for implementation, with indicators to measure progress along the climate smart development pathway.
SUGGESTED METHOD		Discussion and Presentation Exercise
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations,

MODULE 12

ACTION PLANNING

TRAINERS GUIDE

CONTENT SUMMARY

In Module 12, participants will engage in identifying opportunities and planning conscious actions over a timeline to chart out a roadmap for implementation, with indicators to measure progress along the climate smart development pathway.

An exercise engaging the participants, with an introduction from the facilitator may be an appropriate choice ensuring the outcome is participant led and not facilitator or otherwise influenced. Further, participants may be encouraged to collaborate and draw on other relevant actors, stakeholders, processes and resources in the action planning exercise to make it realistic and achievable. In a nutshell, the action plans should be Simple, Measurable, Attainable, Realistic and Time bound (SMART).

ACTION PLANNING EXERCISE

OBJECTIVE: Participants develop an action plan to facilitate their respective organizations, its services and users to become climate smart.

PROCESS: The facilitator will introduce the objective of the Module to participants, followed with a discussion on why participants should engage in the exercise to produce SMART action plans toward making their organizations Climate Smart.

The facilitator will draw on the discussion points in the Module Content section.

A CHECKLIST including tips to guide through the exercise will be prepared and distributed to all participants. The facilitator will ask to participants to read this carefully and clarify anything not clear to any participant. Participants may work individually or in random or selective groups, depending on their composition and areas of interest. The exercise will address the following key questions to produce a SMART action plan:

a. Processes/actions required toward making your organization Climate Smart
b. Processes/actions already underway
c. Enabling environment and resource availability
d. What remains to be done, etc.

The exercise starts once all participants are confident they have understood their role in the exercise. The training facilitator must go in rounds to all participants and observe their efforts, providing inputs and guidance where solicited.

CONSCIOUS ACTIONS FOR A CLIMATE SMART ORGANIZATION

To be a Climate Smart Organization: Conscious Actions need to be planned and implemented by professionals and staff with genuine and inspired commitment and effort. Participation and inclusiveness should be guiding principles, where every one must play their part and share common but differentiated responsibility according to respective capacity. Participatory ownership of success and setbacks as well as pride and satisfaction of being a member of a Climate Smart Organization may be instrumental in motivating progress and success.

From mitigation perspective, a government organization may consider to fulfill commitment to be climate smart with conscious actions in

1. Reducing organizations' total greenhouse gas emissions
2. Reducing electricity use in facilities per square meter
3. Sourcing at least 50 percent of electricity from renewable sources
4. Choosing and promote environmentally-conscious transport
5. Promoting energy efficiency among staff, users, stakeholders

From an adaptation perspective, becoming Climate Smart could be interpreted as taking conscious actions to adapt and reduce climate risks in all activities and processes, all investment and assets, etc. This should take place at all levels, horizontal and vertical. Climate Proofing is an integral part of becoming a Climate Smart Organization or individual. The following action areas therefore may be useful to any organization scoping to embark on a journey toward Climate Smartness.:

1. Assessing Vulnerability to Climate Change (sector, facility, Investment, mandated service delivery and users, etc)
2. Identifying Adaptation Options (includes climate proofing, etc.)
3. Selecting Adaptation Measures
4. Developing a Monitoring and Evaluation Framework
5. Developing Institutional Capacity to Adapt

EQUIPMENT AND MATERIALS
Copies of The Exercise Guide and Checklist distributed as handout, large paper sheets, white, brown or colored, Markers, Tacks, Display board.

OUTCOME: ACTION PLANS All participant/group will produce an action plan as an outcome from the planning exercise, providing details on:

- The rationale for action planning
- What action planning aims achieving
- Who will be responsible for what stages/actions in the plan
- A description of planned actions
- When and where the planned actions will take place
- How (the process) these actions will be implemented
- Qualitative indicators to measure progress and results

The action plans will be presented by participant(s) detailing out where necessary. Each presenter/presenting group should also clarify elements of the action plan where solicited. The facilitator will guide the presentation process and summarize key points from each presentation, and conclude by providing a synthesis of actions in the plan and identified for implementation.

A template for Presenting the Action Plan is provided

Table 12.1 Action Plan Presentation Template

	Planned Action	What the action aims to achieve	How will they be implemented	When and where	Indicators of progress	Who will implement

KEY DEFINITIONS AND CONCEPTS

Key Definitions and Concepts used in the Hand Book

For a comprehensive Glossary of Terms use in Climate Change, please download the

1) Glossary of Terms used in the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX); and
2) Glossary of Terms used in the IPCC Fifth Assessment Report from the following website

http://www.ipcc.ch/publications_and_data/publications_and_data_glossary.shtml

Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Natural hazard	Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.
Vulnerability	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.
Preparedness	The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.
Capacity	The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.
Capacity Development	The process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.
Risk	The combination of the probability of an event and its negative consequences.
Acceptable risk	The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.
Risk assessment	A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.
Risk management	The systematic approach and practice of managing uncertainty to minimize potential harm and loss.

Climate change	(a) The Inter-governmental 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 force or to persistent anthropogenic changes in the composition of the atmosphere or in land use". (b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate 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 time periods".
Adaptation	The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Disaster	A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.
Disaster risk	The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.
Disaster risk management	The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.
Disaster risk reduction	The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.
Disaster risk reduction plan	A document prepared by an authority, sector, organization or enterprise that sets out goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives.
Early warning system	The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

VULNERABILITY

- The degree to which a system is susceptible to and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity and its adaptive capacity (Source: IPCC).
- The degree to which a community, population, species, ecosystem, region, agricultural system, or some other quantity is susceptible to or unable to cope with, adverse effects of climate change (Source: UNFCCC).
- The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. For positive factors, which increase the ability of people to cope with hazards, see definition of 'capacity'. (Source: ISDR).

RISK

- The probability of harmful consequences, or expected loss of lives, people injured, property, livelihoods, economic activity disrupted (or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable conditions. (Source: ISDR).
- Risk is the result of the interaction of physically defined hazards with the properties of the exposed systems - i.e. their sensitivity or (social) vulnerability. Risk can also be considered as a combination of an event, its likelihood and its consequences - i.e. risk equals the probability of climate hazard multiplied by a given system's vulnerability (Source: APF glossary).
- Function of probability and magnitude of different impacts (Source: IPCC).

RISK ASSESSMENT

- A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. The process of conducting a risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic and environmental dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to the risk scenarios. (Source: ISDR).
- Climate Impact Assessment: the practice of identifying and evaluating the detrimental and beneficial consequences of climate change on natural and human systems (Source: IPCC WG II).

ADAPTATION, ADAPTIVE CAPACITY and COPING CAPACITY

- Adaptation: Actions taken to help communities and ecosystems cope with changing climate conditions, such as the construction of flood walls to protect property from stronger storms and heavier precipitation, or the planting of agricultural crops and trees more suited to warmer temperatures and drier soil conditions (Source: UNFCCC).
- Adaptation: is a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed and implemented (Source: APF).
- The means by which people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards. (Source: ISDR)
- Adaptive Capacity: The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. (Source: IPCC)

EXERCISES TO FACILITATE LEARNING

1. CLIMATE LINKS TO DEVELOPMENT GOALS

DURATION		Training Course: 10 minutes
OBJECTIVES		At the end of the session, participants will be able to explain climate links to development goals
KEY POINTS		- Review of development goals of organizations, sectors - How the goal is affected by climate change - Who, what is most at risk; where, when and how - What possible actions to respond to climate risks - Which agencies and stakeholders can contribute to possible action
SUGGESTED METHOD		1.Group work - Participants form small groups. - Each group is given a matrix and a set of data - Groups are instructed to discuss and fill up the matrix - Groups present and discuss their outputs in a plenary 2. Plenary presentation and discussion - Stress the point that the exercise requires participants to enhance their understanding of risks and responsibilities in climate change adaptation
RESOURCES Supplies and Equipment Visual Aids Handouts		White Board, and Marker, LCD Projector, Computer Power point presentations, Documentary Film Causes of Rapid Global Warming

Exercise Matrix 1- Climate links to development goals

Development Goal	How the goal could be affected due to climate change	Who, what is most at risk; where, when and how	Possible actions to respond to climate risks	Agencies and stakeholders who can contribute to possible action

2. ANALYZE CLIMATE DATA

Exercise-Matrix 2: Analyze climate data

Mechanics:

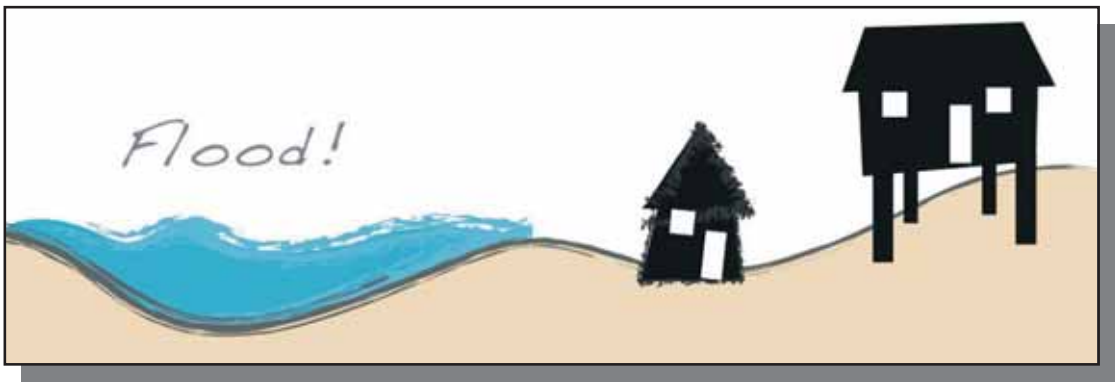
1. Group participants into small groups. It is recommended that these groupings be retained for succeeding exercises
2. Distribute and discuss pre-made information sheets, which ideally are based on participants' own set of data
3. Give the groups 20 minutes to do the exercise
4. Conduct plenary presentations and discussions
   - Group representatives present their collective output
   - In processing the presentations, the trainer should note:
     (a) factors considered by the group in coming up with their responses, e.g. references used
     (b) limitations of the group in doing the exercises
     (c) how the exercise contributed to their understanding and skill in analyzing data

Matrix 2: Analyze climate data

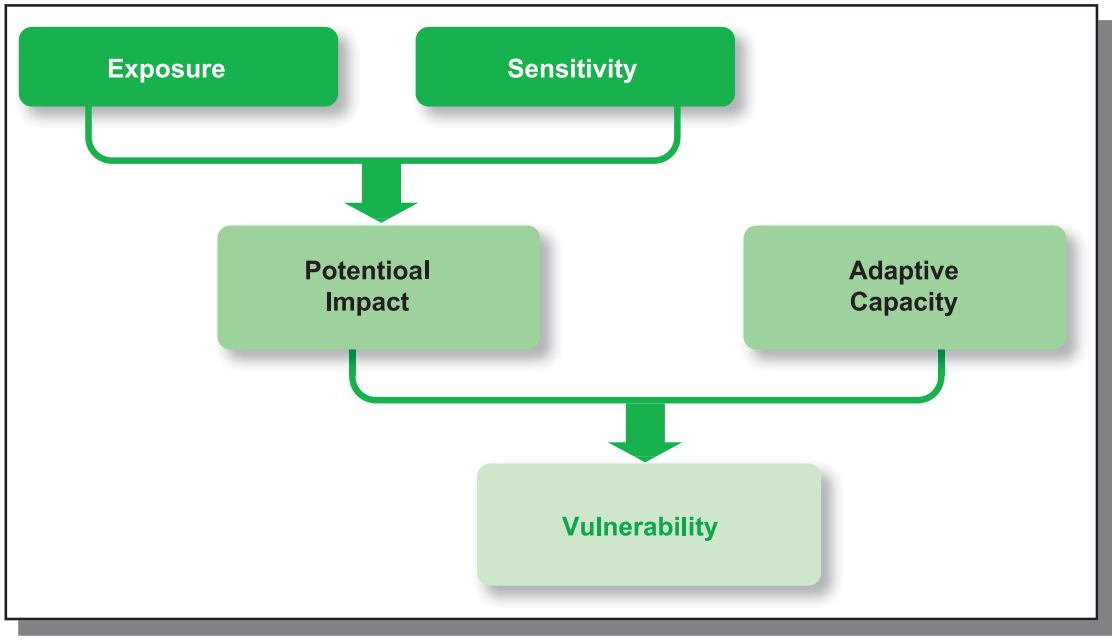
A	B	C	D
Data	What does the data tell you?	What doesn't the data tell you?	What other data to you need to devise adaptation strategies?
Example:	Example:	Example:	Example:
Rainfall	• There will be stronger rains • No significant occurrence of tropical storms	Measures to adapt to the changing patterns of rainfall	Temperature

Activity learning exercise

Using the following pictures, go through the exercise of getting the participants to analyze the level of vulnerability of the system of interest:



For analysis, the diagram below may be used



* Arrows can be used to depict increase/decrease in the elements

3. ANALYSIS OF SENSITIVITY AND ADAPTIVE CAPACITY

Once participants acquire a grasp of the concept and factors affecting vulnerability, proceed to

Matrix 3: Assess current vulnerability

Mechanics

1. Group participants into small groups. Previous groupings can be retained
2 Distribute Matrix 3: Assess current vulnerability, and discuss with participants
3. Give the groups 20 minutes to do the exercise
4. Conduct plenary presentations and discussions

- Group representatives present their collective output
- In processing the presentations, the trainer should note:

  (a) factors considered by the group in coming up withtheir responses, e.g. references used
  (b) limitations of the group in doing the exercisesc) how the exercise contributed to their understanding and skill in analyzing data

Exercise-Matrix 3: Assess current vulnerability

	A	B	C
System of interest	**Current climate variability**	**Current sensitivity to climate variability**	**Current adaptive capacity**
Example:	Example:	Example:	Example:
Coral reef	Sea surface temperature increase	• Only 30% of the coral cover is in good condition • Coral is known to be sensitive to temperature increase of 10ºC	• Good diversity in coral species in the coral reef • Community established marine protected area

RESOURCES TO CONTINUE LEARNING

While education finishes after schooling, learning continues to take place throughout our course of life - at work or at home. A list of relevant reference reading materials is suggested to stimulate further interest and uptake. In addition, a comprehensive but not exhaustive list of important websites is provided - for Bangladesh as well as International organizations - to update progresses and to expand knowledge search.

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WEB LINKS

1. INTERNATIONAL

UN Events

Warsaw Climate Change Conference - November 2013 (COP 19):
http://unfccc.int/meetings/warsaw_nov_2013/meeting/7649.php

General Assembly Thematic Debate Sustainable Development and Climate Change: Practical Solutions in the Energy Water Nexus, 16 May 2013:
http://www.un.org/en/ga/president/67/issues/climatechange/climatechange_index.shtml

Security Council Meeting, 20 July 2011: Maintenance of international peace and security - Impact of climate change: http://www.un.org/en/sc/meetings/records/2011.shtml

High-level Event on Climate Change, 22 September 2009, UN Headquarters:
http://www.un.org/wcm/content/site/climatechange/lang/en/pages/2009 summit

High-level thematic debate on climate change - Addressing climate change, the United Nations and the world at work (11-12 February 2008):
http://www.un.org/ga/president/62/ThematicDebates/themclimatechange.shtml

High-level Event on Climate Change, UN Headquarters, New York, 24 September 2007:
http://www.un.org/climatechange/2007highlevel/

Thematic Debate of the General Assembly - "Climate Change As a Global Challenge", 31 July - 2 August 2007: http://www.un.org/ga/president/61/follow-up/thematic-climate.shtml

UN Entities

Secretariat of the UN Framework Convention on Climate Change (UNFCCC): http://unfccc.int/

Intergovernmental Panel on Climate Change (IPCC): http://www.ipcc.ch/

Gateway to the UN System's Work on Climate Change (UN Climate Change Portal):
http://www.un.org/climatechange/ This website provides easy access to climate change information, such as fact sheets, news, calendar of events, and links to the pages describing the work on climate change issues by various UN System organizations and specialized agencies.

UN Treaties, Declarations and selected UN documents

United Nations Framework Convention on Climate Change:
http://unfccc.int/essential_background/convention/items/2627.php

Kyoto Protocol: http://unfccc.int/kyoto_protocol/items/2830.php

Bali Road Map: http://unfccc.int/key_steps/bali_road_map/items/6072.php

Cancun Agreements: http://unfccc.int/key_steps/cancun_agreements/items/6132.php

Durban Outcomes: http://unfccc.int/key_steps/durban_outcomes/items/6825.php

Doha Climate Gateway: http://unfccc.int/key_steps/doha_climate_gateway/items/7389.php

Climate change and its possible security implications: report of the Secretary-General (A/64/350, 11 September 2009): http://undocs.org/A/64/350

Further information

Climate Community (UNDP): http://www.undpcc.org/

Global Issues on the UN Agenda: Climate Change:
http://www.un.org/en/globalissues/climatechange/index.shtml

Women, Gender Equality and Climate Change (UN WomenWatch):
http://www.un.org/womenwatch/feature/climate_change/

UN Documentation on the Environment: Research Guide prepared by the UN Dag Hammarskjöld Library:
http://research.un.org/en/docs/environment

Selection of Publications available online

The Emissions Gap Report 2012 (UNEP, November 2012):
http://www.unep.org/publications/ebooks/emissionsgap2012/

Turn Down the Heat: Why a 4°C warmer world must be avoided (World Bank, November 2012):
http://climatechange.worldbank.org/sites/default/files/Turn_Down
_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf

Climate change vulnerability and the identification of least developed countries (CDP Background Paper No. 15, June 2012): http://www.un.org/en/development/
desa/policy/cdp/cdp_background_papers/bp2012_15.pdf

Protecting People Crossing Borders in the Context of Climate Change: Normative Gaps and Possible Approaches (UNHCR, February 2012): http://www.unhcr.org/4f33f1729.html

Women at the Frontline of Climate Change: Gender Risks and Hopes (UNEP, 2012):
http://www.grida.no/files/publications/women-and-climate-change/rra_gender_screen.pdf

YouthXchange Guidebook on Climate Change and Lifestyles (UNESCO / UNEP, 2011):
http://www.unep.org/pdf/YXC_CC_Single_Pages_230911.pdf

Climate Change Starter's Guidebook (UNESCO / UNEP / WHO, 2011):
http://unesdoc.unesco.org/images/0021/002111/211136E.pdf

Special Report on Renewable Energy Sources and Climate Change Mitigation (IPCC SRREN, 2011):
http://srren.ipcc-wg3.de/report

Technology Needs Assessment for Climate Change Handbook (UNDP/UNFCCC, December 2010):
http://content.undp.org/go/newsroom/publications/environment-energy/www-ee-library/sustainable-energy/technology-needs-assessment-for-climate-change-handbook.en

UNEP Publications on Climate Change:

http://www.unep.org/publications/search/title_search.asp?search=climate+change

UNFCCC Publications:

http://unfccc.int/essential_background/background_publications_htmlpdf/items/2625.php

IPCC Publications (including IPCC Assessment Reports)
http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm

Vital Climate Change Graphics (UNEP/GRID-Arendal, 2005) http://www.vitalgraphics.net/climate2.cfm

2. BANGLADESH

Bangladesh Climate Change Resilient Fund www.bccrf-bd.org

BMD Bangladesh Meteorological Department www.bmd.gov.bd

CBACC Community based Adaptation through Coastal Afforestation Project www.cbacc-coastalaffor.org.bd

CCC Climate Change Cell www.climatechangecell.org.bd

CCCP Community Climate Change Project www.pksf-cccp-bd.org

CDMP Comprehensive Disaster Management Programme www.cdmp.org.bd

CEGIS centre for Environmental and geographical Information System www.cegisbd.com

DAE Department of Agriculture Extension www.dae.gov.bd

DDM Department for Disaster Management www.ddm.gov.bd

DOE Department of Environment www.doe.gov.bd

E-Library: www.dmic.org.bd/e-library

FAO www.fao.org

FFWC Flood Forecasting and Warning Centre www.ffwc.org.bd

IWFM Institute of Flood and Water Management - BUET www.buet.ac.bd/iwfm

IWM Institute of Water Modelling www.iwmbd.org

Livelihoods Adaptation to Climate Change (LACC) Project www.fao.org/climatechange/laccproject

Ministry of Environment and Forests www.moef.gov.bd

PECM www.pecm.org.bd

UNDP Bangladesh www.bd.undp.org

WB The World Bank Bangladesh www.worldbank.org/en/country/bangladesh

TRAINING EVALUATION SHEET

(Please fill out the following at the end of the training)

Information about you

Surname: _____ First Name: _____

_____

Job Title: _____

Duty Station or Office Location: _____

Training dates : Venue:

Overall Programme Organization/Administration

PLEASE CIRCLE TO WHAT EXTENT YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS:

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. Pre-training administrative and logistics aspects of the programme were well-organized and communicated	5	4	3	2	1
2. Subject matter (content) was adequately covered in the training	5	4	3	2	1
3. Overall programme content was suitable for my background and experience	5	4	3	2	1
4. Training was well-placed	5	4	3	2	1
5. Training book/handouts were well organized and useful	5	4	3	2	1
6. Participants were encouraged to take an active part in the programme	5	4	3	2	1
7. The programme met my individual objectives	5	4	3	2	1
8. Programme was relevant to my job	5	4	3	2	1
9. I am satisfied that the time I spent at the training was worthwhile	5	4	3	2	1
10. I would recommend this programme to my colleagues	5	4	3	2	1

PLEASE RATE THE FOLLOWING, AS APPLICABLE

Aspect or Area of the training	Excellent	Good	Average	Poor	Unsatisfactory
11. Lecture method	5	4	3	2	1
12. Small group sessions	5	4	3	2	1
13. Visuals – PowerPoint/film/video	5	4	3	2	1
14. Meeting space	5	4	3	2	1
15. Meals/refreshments	5	4	3	2	1
16. Overall logistics/organization	5	4	3	2	1

17. Was the training length: correct? ☐ too short? ☐ too long? ☐

18. Were there: just enough participants? ☐ too few? ☐ too many? ☐

19. Do you feel that any subjects received too much time in this training? Please explain.

20. Do you feel that any subjects received too little time in this training? Please explain.

21. Do you have any suggestions that you could improve this training from your observation?

22. How will you be able to apply anything learned in the training (practical application) in your own Work place?

23. Any other comments on this training event?

_____
_____
_____
_____
_____
_____

24. What is your overall rating of this training?

☐ Excellent ☐ Good ☐ Average Bad ☐ Terrible

Please rate the individual training sessions

5 = Excellent 4 = Good 3 = Average 2 = Poor 1 = Unacceptable NA = Does not apply

	Session No. & Title	Quality	Value to my Work
1.	Welcome, Introductions, Workshop Objectives	5 4 3 2 1 NA	5 4 3 2 1 NA
2		5 4 3 2 1 NA	5 4 3 2 1 NA
3		5 4 3 2 1 NA	5 4 3 2 1 NA
4		5 4 3 2 1 NA	5 4 3 2 1 NA
5		5 4 3 2 1 NA	5 4 3 2 1 NA
6		5 4 3 2 1 NA	5 4 3 2 1 NA
7		5 4 3 2 1 NA	5 4 3 2 1 NA
8		5 4 3 2 1 NA	5 4 3 2 1 NA
9		5 4 3 2 1 NA	5 4 3 2 1 NA
10		5 4 3 2 1 NA	5 4 3 2 1 NA
	Closing	5 4 3 2 1 NA	5 4 3 2 1 NA

Please return this evaluation to the training facilitator

Thank you very much for completing the evaluation sheet.

Comprehensive Disaster Management Programme (CDMP II)
Ministry of Disaster Management and Relief

UKaid
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European Union

NORWEGIAN EMBASSY

SWEDEN

Australian Aid

UNDP
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