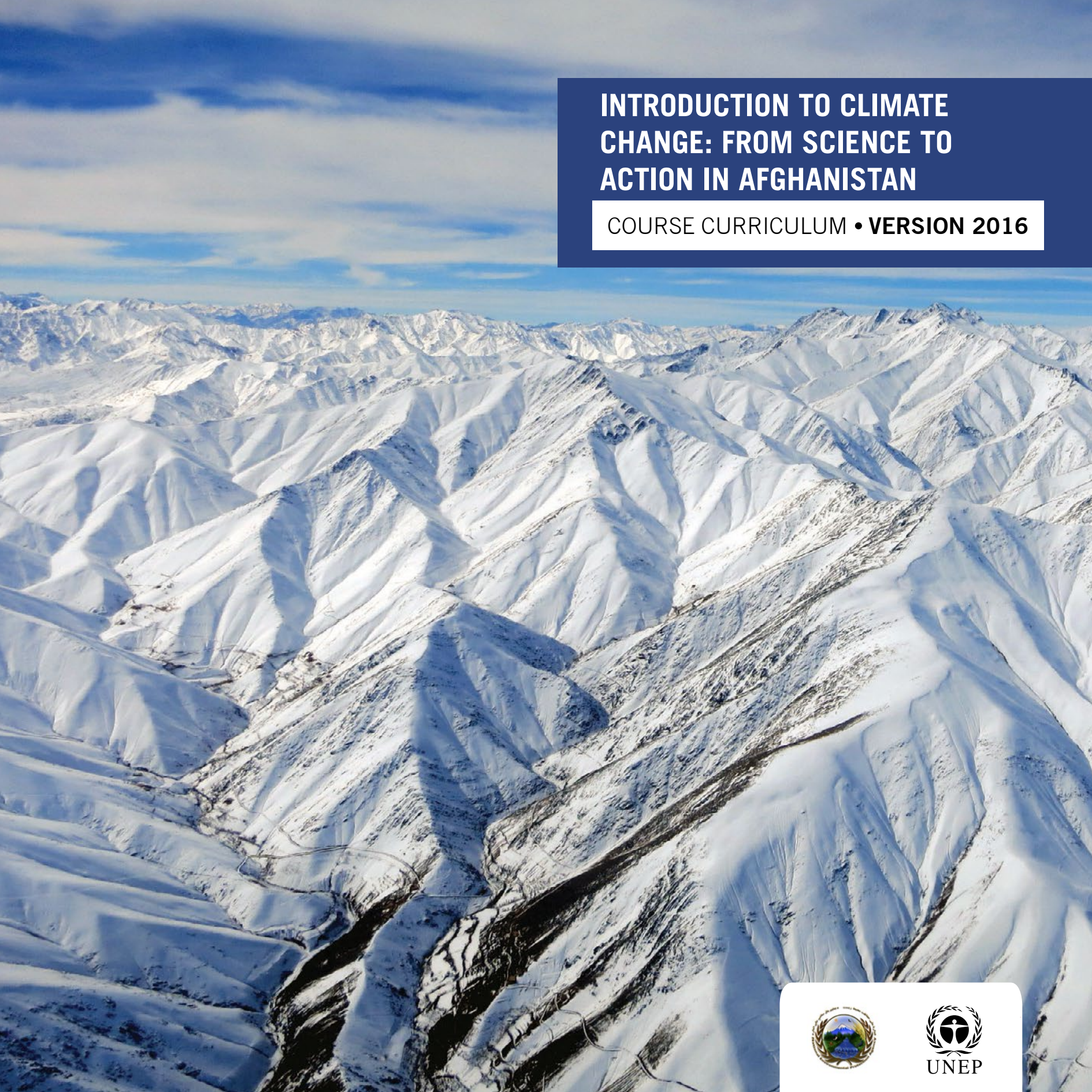

INTRODUCTION TO CLIMATE CHANGE: FROM SCIENCE TO ACTION IN AFGHANISTAN

COURSE CURRICULUM • **VERSION 2016**

UNEP

Introduction to Climate Change: From Science to Action in Afghanistan

UNEP Afghanistan / National Environmental Protection Agency

Disclaimer – Acknowledgements:

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United Nations Environment Programme (UNEP)

UNEP

The United Nations Environment Programme (UNEP) is the lead environmental branch of the United Nations and, since 2002, has taken an active role in laying the environmental foundations for sustainable development in Afghanistan. UNEP's engagement began with a major post-conflict environmental assessment, conducted together with the Government of Afghanistan, which highlighted the serious and widespread environmental and natural resource degradation issues caused by decades of conflict. This led to a request from the Afghan Government for UNEP to provide technical assistance to set up the National Environmental Protection Agency. UNEP's support to Afghanistan has since expanded to focus on strengthening structures of environmental governance, building adaptive capacity to climate change, environmental education and awareness, biodiversity and protected areas, ecological disaster risk reduction, and multilateral environmental agreements.

National Environmental Protection Agency (NEPA)

NEPA was established by presidential decree in 2005 and is Afghanistan's foremost environmental regulatory, policy-making, coordinating, monitoring, and enforcing institution. Its goal is to "protect the environmental integrity of Afghanistan and support sustainable development of its natural resources through the provision of effective environmental policies, regulatory frameworks, and management services that are also in line with the Afghanistan MDGs." Moreover, the Environment Law (2007) further clarifies NEPA's mandate, powers, responsibilities, and functions to include promotion of sustainable use of natural resources; conservation and rehabilitation of the environment; coordination of environmental affairs in Afghanistan; development of national environmental policies, strategies, and legislation; building public awareness and outreach about environmental matters; and implementing the international environmental conventions that Afghanistan is a Party to; and enforcement of the provisions of the Environment Law.

LIST OF ABBREVIATIONS

ANDMA	Afghanistan National Disaster Management Authority
CNRD	Centre for Natural Resources and Development
DRR	Disaster risk reduction
Eco-DRR	Ecosystem-based disaster risk reduction
EbA	Ecosystem-based adaptation
EWS	Early warning system
GHGs	Greenhouse Gases
HFA	Hyogo Framework for Action
INC	Initial National Communication under the UNFCCC
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
MEA	Multilateral Environmental Agreement
MSRI	Mountain Societies Research Institution
NBSAP	National Biodiversity Strategy and Action Plan
NEPA	National Environmental Protection Agency
NGO	Non-governmental organisation
NRM	Natural resource management
PCDMB	Post-conflict and Disaster Management Branch, UNEP
PEDRR	Partnership for Environment and Disaster Risk Reduction
PES	Payment for Ecosystem Services
ToT	Training of trainers
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WCMC	World Conservation Monitoring Centre

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Course Curriculum • Version 2016

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Understanding the potential consequences of climate change for ecosystems and human populations is essential to making informed decisions and planning responses to pressing climate issues. Although there is a wide range of scientific literature on the impacts of climate change available, including from the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC), still much remains to be researched and understood. Moreover, climate change is also expected to exacerbate the frequency and severity of global weather phenomena, which will likely lead to an increased frequency and severity of natural hazards and necessitates greater planning for applying sustainable environment management solutions for adaptation and reducing disaster risk. We are only now beginning to see the preliminary impacts of climate change, and what the future holds for us is still unknown. Nevertheless, ecosystem-based solutions are among the most sustainable methods to building adaptive capacity, primarily because they capitalize on ecosystem-services, such as forests and wetlands, that act as natural infrastructure that help reduce exposure to many hazards (floods, droughts, landslides, etc.) and increase the socio-economic resilience of people and communities by sustaining local livelihoods and providing other essential resources, such as food, water, and building materials (CNRD-PEDRR, 2013: 11).

Based on currently available temperature and precipitation data in conjunction with global models and GHG scenarios (Representative Concentration Pathways "RCP"), UNEP and NEPA have developed detailed climate change projections for the country which shows a significant increase in annual mean temperature in comparison to the baseline period of 1986-2006 with an increase of 1.5°C in the best-case scenario (RCP2.6) until 2050, followed by a period of stabilization and then warming of 2.5°C until 2100. Moreover, these projections show warming of 3°C by 2050 and up to 7°C by 2100 in the worst-case scenario (RCP8.5). (See figure 1 and figure 2)

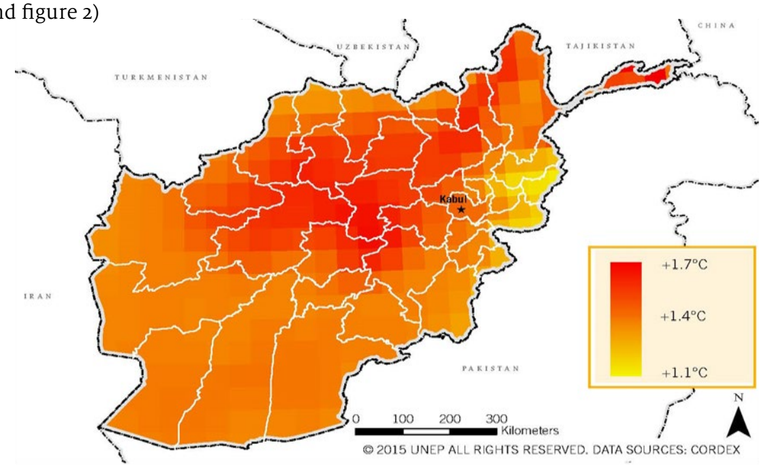


Figure 1. Difference of mean annual temperature between a near future period (2021-2050) and the base period (1985-2006) as mean of eight different regional climate models for the representative concentration pathway 4.5. All grids of all models show a positive trend.

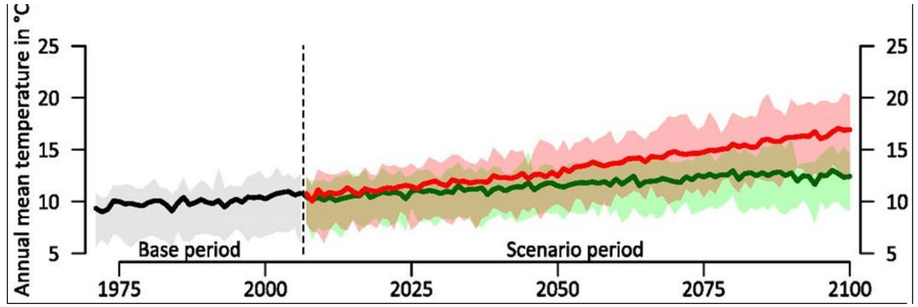


Figure 2. Trends in mean annual temperature for Afghanistan of seven different regional climate models and the representative concentration pathway 4.5 (green) and 8.5 (red). The lines are the model means and the band of uncertainty of all models is depicted in brighter colors.

The projections for precipitation in the country, on the other hand, shows relatively weak trends except the moderate (RCP4.5) and the worst-case scenarios (RCP8.5), which show a negligible difference. Moreover, the visual analysis reveals no significant change in frequency of annual rainfalls during the scenario period (see figure 3 and 4).

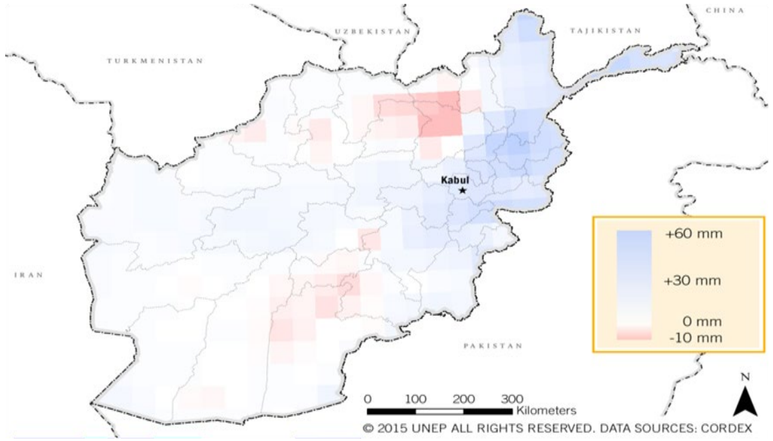


Figure 3. Difference of annual precipitation between a near future period (2021-2050) and the base period (1985-2006) as mean of eight different regional climate models for the representative concentration pathway 4.5.

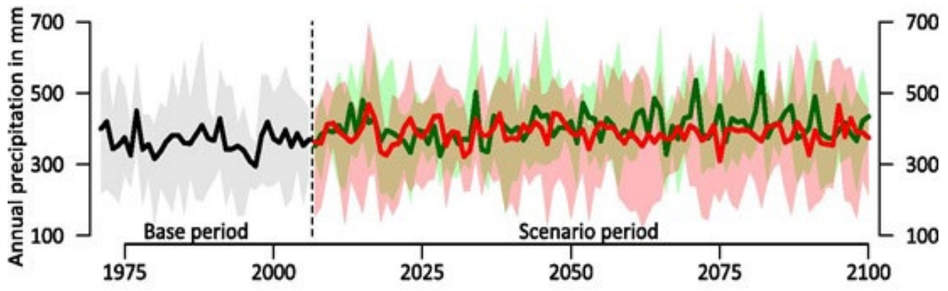


Figure 4. Trends in annual precipitation for Afghanistan of seven different regional climate models and the representative concentration pathway 4.5 (green) and 8.5 (red). The lines are the model means and the band of uncertainty of all models is depicted in brighter colours.

The objective of this *Introduction to Climate Change: From Science to Action in Afghanistan training* course is to support government leaders in Afghanistan, at national and provincial levels, to better understand, prepare for, and mitigate the future risks of climate change. More specifically, this training course will help participants to develop national- and provincial-level plans for addressing climate change, as well as to better understand how climate change affects them as individuals, as members of their community, as citizens of their country, and as members of the global community. Afghanistan is already highly vulnerable to natural hazards, and a changing climate is likely to significantly exacerbate their impacts unless measures are taken to strengthen the country's adaptive capacity and preparedness to natural hazards. With enhanced capacities to protect the environment and address disaster risks, it is expected that government authorities will be able to contribute even more substantially to improve the socio-economic wellbeing of local communities as well as to advance provincial, national, and regional programmes for environmental conservation.

The present training course begins with an introduction to the science of climate change (module 1), followed by an overview of the anticipated impacts of climate change on water, agriculture, and biodiversity (module 2). Next, the course provides an overview of approaches for adaptation to climate change (module 3) and mitigation of climate change by reducing Greenhouse Gas emissions (module 4), followed by an introduction to climate-smart technologies applicable in the context of Afghanistan (module 5), as well as a summary of global climate change frameworks and resources available to help Afghanistan address its urgent climate change needs (module 6). Lastly, the course includes a practical session (module 7) that provides a hand-on experience of a governance decision making workshop in Kabul as a complement to the previous six classroom-based modules. It is intended that participants shall be able to integrate the concepts they learn into their work, and to introduce strategic cross-sectoral thinking into their work places in order to increase environmental resilience and ensure that the negative impacts of hazards and climate change do not undermine the country's development progress.

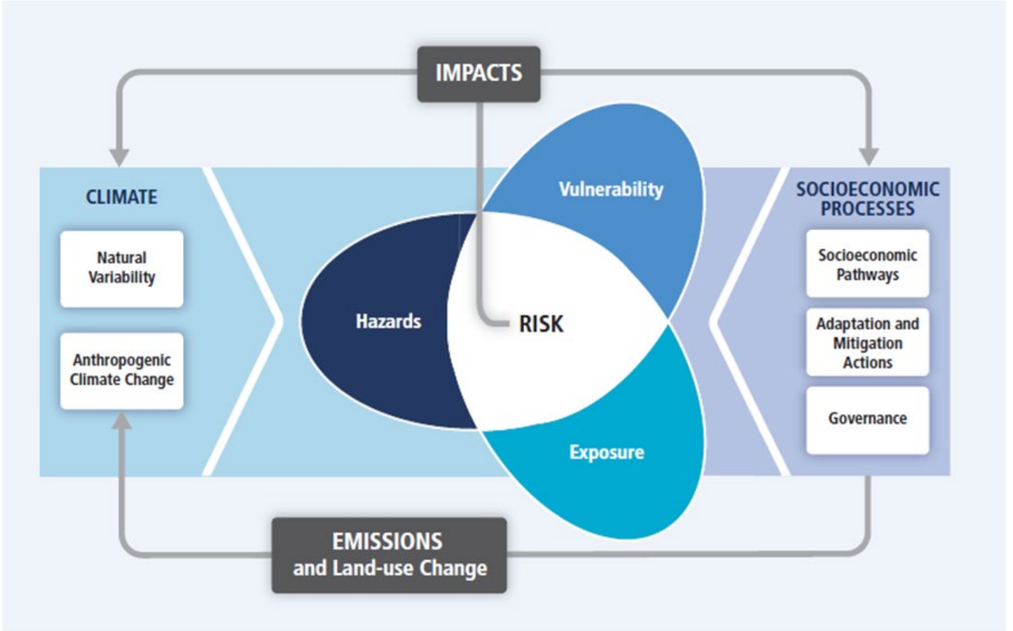


Figure 5: Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems. Changes in both the climate system (left) and socioeconomic processes including adaptation and mitigation (right) are drivers of hazards, exposure, and vulnerability. (IPCC, 2014)

MODULE SUMMARY

SESSION AND CONTENT	MATERIALS AVAILABLE
1. Introduction to Climate Change Science (3 hours) • Overview of course content, structure, and learning objectives • Basic environmental terminology (environment, biodiversity, climate, resilience, sustainability, ecosystem, ecosystem services) • Explaining weather, climate and climate change • Origins and impacts of climate change • Climate change projections for Afghanistan	• Pre-assessment questionnaire • Lecture • Case study • Movie (2) • Guidance Chart
2. Impacts of Climate Change (3 hours) • Overview of climate change impacts on water, agriculture, and biodiversity. • Mapping of climate change risks to vulnerable sectors • Summary of major impacts of climate change on hydrological processes and subsequent downstream sectoral impacts.	• Lecture • Movie (3) • Student exercise
3. Climate Change Adaptation (3 hours) • Introduction to the science of climate change adaptation • Links between climate change adaptation and development • Principles of ecosystem-based adaptation (EbA) and eco-DRR • Principles of community-based natural resource management (CBNRM)	• Lecture • Movies • Student exercise
4. Climate Change Mitigation (3 hours) • Introduction to the science of climate change mitigation • Principles of renewable energy • Principles of energy efficiency • Principles of low-emission urban systems • Principles of carbon sequestration	• Lecture • Movie • Student exercise

MODULE SUMMARY

5. Climate-smart Technologies (3 hours) • Overview and history of climate technologies • Introduction to the Climate Technology Centre and Network (CTCN) • The role of the UNFCCC in climate technology transfer • The importance and examples of climate technology transfer for adaptation and mitigation	• Lecture • Movie • Student exercise
6. Climate Change Frameworks, Governance, and Finance (3 hours) • Overview of global climate change frameworks, including MEAs. • Introduction to the concept of climate governance, the diverse actors involved, and the various linkages between global, national, regional, and community-based initiatives. • Introduction to global climate finance opportunities and processes to access resources. • Overview of how to prepare a project concept for a multilateral climate donor.	• Lecture • Movie (2) • Student exercise • Group game and competition
7. Workshop: Prioritization of Climate-sound Technologies for the Agriculture, Energy and Water Sectors (4 hours) • Students are able to identify important climate mitigation and adaptation technologies. • Students are familiar with the mini Technology Need Assessment Process. • Students are more familiar with Climate-sound technologies. • Students are familiar with ongoing national processes in terms of Climate Change.	• Technology Need Assessment Handbook • Workshop

1. Teaching Philosophy

This *Climate Change: From Science to Action in Afghanistan* training course is an interdisciplinary curriculum that empowers students to integrate the concepts and practical skills they learn within their work environment. This is achieved by providing activities that permit learners to compare the theoretical aspects of the training with their experiences. In addition, the curriculum is student centred and promotes critical thinking on issues related to biodiversity and conservation in Afghanistan. Therefore, each module typically includes at least one full hour devoted to class discussions, hands-on case studies, and group work, in addition to a practical field trip during the last module.

Our Main Teaching Philosophies

1 STUDENT CENTERED

Teachers encourage students to share insightful observations and commentaries based on their real life experiences.

2 CRITICAL THEORY

Teachers provide forums for student reflective learning and cross-sectoral thinking through class discussions, case studies, group exercises, and student presentations.

3 MULTICULTURALISM

The curriculum fosters equal participation across gender and multi-cultural environments while engaging students in diverse issues, topics, and problems. The curriculum is also adaptable to local needs and promotes sensitivity to cultures and different beliefs.

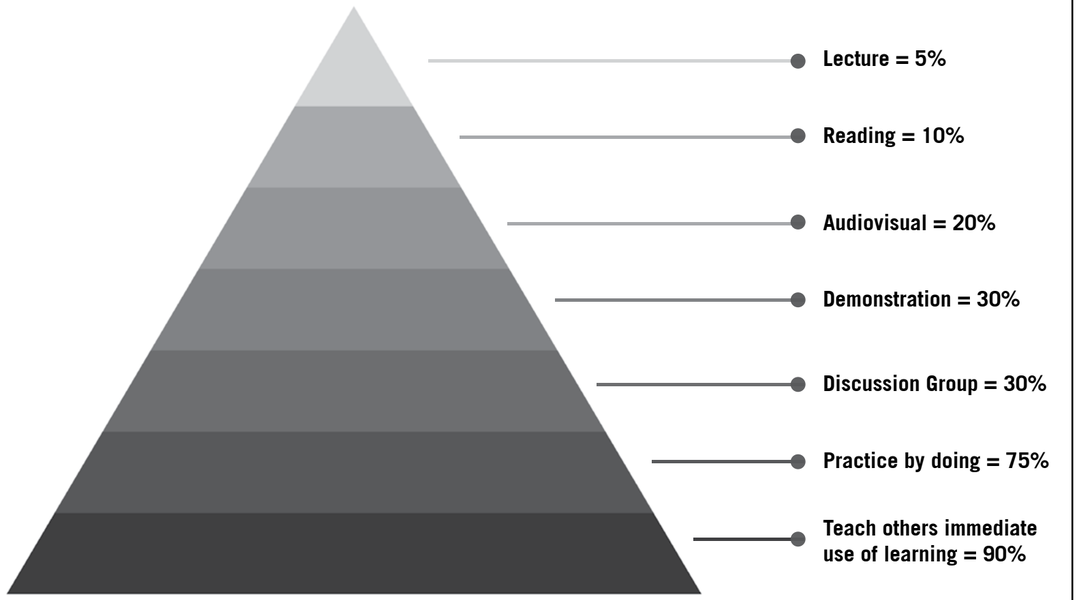
Tailoring the Modules:

Teachers are encouraged to integrate scenarios and examples they have learned through their own experiences into this curriculum. Remember: the course curriculum provides the guide – but the teachers and students choose the path!

2. Teaching Methods for Sharing Knowledge

Choosing instructional strategies that focus on students "doing" something with the information they learn rather than simply "knowing" is important for enhancing learning retention rate. The Learning Pyramid (Figure 1, below) shows percentage of learner recall according to different methods of teaching. The first four levels (lecture, reading, audio visual, and demonstration) are passive learning methods, which are grounded in traditional instruction. The bottom three levels (discussion group, practice by doing, and teaching others) are active learning methods, implying that students participate as autonomous learners, which result in higher retention of learning.

Fig. 1: LEARNING PYRAMID (CNRD-PEDRR, 2013)



3. Teaching Approach

This training course includes seven modules. The first six modules are taught in three hour sessions and the last module is a practical activity and a Workshop. The modules have been purposefully sequenced for students to understand key terminology and concepts, identify crosscutting biodiversity linkages, and practically articulate the Climate change issues studied in action during a Workshop. Each of the seven modules provided in this Course Curriculum are divided into six parts as described in the table below.

COMPONENTS	DETAILS
Outline	Provides teachers and students an overall plan for the module with background information regarding the module topic.
Learning Objectives	Learning objectives are specific and will measure what the students will be able to do at the end of the module. Begin by stating objectives at the start of each module. During class discussions, group work, and student presentations refer to the learning objectives to test students' knowledge and skills.
Key Discussion Points	4-5 key questions related to the learning objectives are provided to help teachers facilitate class discussions.
Teaching Resources	A list of teaching resources for instructing the module are provided, including lectures, movies, case studies, pre- and post-training assessment tests, and module evaluation forms. These materials should be prepared, reviewed, and revised (if necessary) by the teacher in advance of teaching the module. All these materials can be found in soft copy on the USB accompanying this Course Curriculum booklet.
Module Guidance	A step-by-step guidance on how to instruct the module. It is up to the teacher to determine the time allocation for each step; however, it is recommended that lecturers do not take more than one hour of class time and interactively engage students in class discussions.
Key Readings	3-5 essential readings to provide students with a scholarly introduction to the module topic. Readings are brief and should be read by students before each lecture so that they are sufficiently prepared to engage in group discussions and activities. These are available on the USB.

4. Assessment

Throughout this training package, summative and formative assessments are used to evaluate students' and teachers' performance as well as the effectiveness of the overall course through qualitative and quantitative tools as follows:

- Alternative Assessments: This training package encourages the use of alternative forms of assessment to capture more complex learning outcomes such as creative thinking, problem solving, and reflection. Alternative assessments are the responsibility of the teacher and can be done through teachers' observation, class discussions, group work, and student presentations.

- Pre-test and Post-test (Annexes 3 and 4): A pre- and post-test are provided at the beginning and end of the training package to provide valuable information on student knowledge and skills gained throughout the training course. In addition, the pre- and post-test provides the teacher with better understanding of which concepts or competencies were well taught and which ones need additional time or revision. Also, please note, an alterative assessment approach was adopted for the post-test of this course, therefore the post-test takes the form of an interactive activity (mock ecosystem conservation plan) in the final module 7.

- Module Evaluation Form (Annex 5): This form is provided to students at the end of each module to gain their feedback on the effectiveness of the teaching instruction, facilities, activities, and content.

- Participants Feedback Form (Annex 6): This is distributed at the end of the training package for students to assess the entire program and provide feedback on how they will apply the knowledge they learned in their work.

- Module Reflection and Revision Form (Annex 7): It is recommended that teachers use the Module Reflection and Revision Form the first time they deliver the modules. Teachers should note any challenges encountered during the delivery of the module and ways they adapted the instruction. Teachers should record this information immediately after delivering each module and keep a record of this information for future delivery of the training package.

- Follow up strategy: It is recommended that teachers follow-up with students 2-3 months after the delivery of the training to identify if students are able to retain and implement the knowledge and skills learned into practice within their work. Follow-up may be done via email or site visits with the use of a questionnaire or site observation. This information will be helpful in identifying which instructional activities had the most impact.

Introduction to Climate Change Science

MODULE 1

Introduction to Climate Change Science (3 hours)

OUTLINE

This module is the introductory session that has been developed for a non-specialist group to introduce basic concepts, terminology, and actions that relate to climate change. Particular emphasis is placed on understanding the factors that contribute to climate change and how it is linked to increased risk of natural hazards. The module will also explain the concept of vulnerability to climate change in the specific context of Afghanistan.

Climate change refers to alterations in the earth's atmosphere that have long-term effects, such as climate warming, changes in precipitation levels, or increased frequency of extreme weather. Changes to and fluctuations in the earth's climate are constantly happening as a result of natural processes, but since the Industrial Revolution, human activity has caused the earth's climate to enter a period of global warming. This global warming can largely be attributed to increased emissions of Greenhouse Gases (GHGs), such as carbon dioxide, that are released into the atmosphere when fossil fuels are burned. Although scientists continue to debate the exact mechanisms behind climate change, there is an overwhelming consensus that recent changes in the earth's climate are the result of human activity.

In recent decades, climate change has already begun to have impacts on natural and human systems on all continents and across the oceans. Evidence of climate-change impacts is strongest and most comprehensive for natural systems. Some impacts on human systems have also been attributed to climate change such as disasters, emergencies, and migration, with a major or minor contribution of climate change distinguishable from other influences (IPCC, 2014). Even though Afghanistan is a developing country with only 0.4metric tons per capita of GHG emissions in 2011 (World Bank, 2011), it is the third most vulnerable country to climate change (INFORM Index, 2015). In order to reduce the risks of climate change in Afghanistan, it is most important for the country's leaders, people, and decision-makers to understand the science of climate change, the anthropogenic reasons behind climate change, what the country's vulnerabilities to climate changes are, and what can be done to increase adaptive capacity and resilience.

LEARNING OBJECTIVES

- Students understand basic concepts and terminology of climate change.
- Students are able to map climate change risks to their locality through a group exercise.
- Students are able to identify the causes of climate change through a group discussion.

KEY DISCUSSION POINTS

- What are the major causes and risks of climate change?
- How do you see climate change affecting your area? What hazards or changes in climate have you noticed in recent years?
- What are the linkages between climate change and risks posed by other natural hazards already occurring in Afghanistan?
- What are some of climate change impacts threatening your province, district or village?

Introduction to Climate Change Science (3 hours)

TEACHING RESOURCES:

- Pre-training assessment questionnaire (Annex 3)
- Lecture #1 (4 parts): *Introduction and Overview of Climate Change Science*
- 5-minute movie: *How Does the Climate System Work* (UK MET Office, 2013)
- 5-minute movie: *NASA Global Changes in Climate* (2000-2100) (NASA, 2015)
- Case study: *Climate Change and Gender (The Mama Watoto* Group)
- Guidance Chart: *Climate Change Threats and Vulnerabilities in Afghanistan* (UNEP & NEPA 2015)
- Module evaluation form (Annex 5)

KEY READINGS

- Dressler, A.E. (2015). Introduction to Modern Climate Change (p 1-5). Cambridge: Cambridge University Press.
- IUCN, UNDP & GGCA. (2009). 'Overview of Gender Issues and Climate Change.' In Lorena Aguilar. (2009). *Training Manual on Gender and Climate Change*, 79-96.
- Pew Center on Global Climate Change. (n.d.). *Climate Change 101: Understanding and Responding to Global Climate Change, The Science and Impacts*. Arlington & Washington D.C.: Pew Center on Global Climate Change and Pew Center on the States.
- Rahmstorf, S. (2010). *Climate Change – State of the Science*. Potsdam: Potsdam Institute for Climate Impact Research.
- UN General Assembly. (1988). *Protection of Global Climate for Present and Future Generations of Mankind*, A/RES/43/53. New York: UN.

MODULE GUIDANCE:

- Step 1. Provide students with an overview of the course structure and teaching methods, and deliver pre-training assessment questionnaire to gauge baseline level of knowledge.
- Step 2: Present lecture #1 (part 1): *Introduction to Climate Change.*
- Step 3: Show 5-minute movie: *How Does the Climate System Work.*
- Step 4: Present lecture #1 (part 2): *The Science of Climate Change and Its Anthropogenic Drivers.*
- Step 5: Group Activity: Provide students will copies of the Climate Change Guidance Chart and ask them to discuss which threats they knew about and which are new to them, providing examples from their provinces, districts or villages.
- Step 6: Present lecture #1 (part 3): *Climate Change, Hazards, and Vulnerability in Afghanistan.*
- Step 7. Show movie: *NASA Global Changes in Climate (2000-2100).*
- Step 8: Present lecture #1 (part 4): *Climate Change and Gender.*
- Step 9: Group Activity: Divide students into two groups and distribute copies of the case study Climate Change and Gender (Annex 8). Ask each group to discuss the key questions included in the case study and then select a representative to report back to the whole group on their findings.
- Step 10: Group Activity: Divide the students in groups representing four regions of the country, and ask students to identify the direct risks of climate change in Afghanistan and their examples in the country using the same table format that is provided in the previous case study. Once completed, each group will report back to the whole class on their findings. Refer to Annex 8 for more information.
- Step 11: Distribute module evaluation form to students to complete and return to the instructor.

Impacts of Climate Change

MODULE 2

Impacts of Climate Change (3 Hours)

OUTLINE

As a result of climate change, changes in precipitation and increased melting of snow and ice are altering hydrological systems, which affects the quantity and quality of water resources available. In particular, glaciers are shrinking around the world, affecting runoff and water resources downstream. Climate change is also causing permafrost to warm and thaw in high-latitude regions and in high-elevation regions. Also, in response to climate change, many terrestrial, freshwater, and marine species have shifted their geographic ranges, seasonal activities, migration patterns, and types of inter-species interaction resulting in biodiversity loss and even extinction of some species.

Changes of magnitude and frequencies of climate-related extremes like heavy precipitation events alter ecosystems, forests and rangelands, and may disrupt food production. For countries at all levels of development, these impacts are consistent with a significant lack of preparedness for current climate variability in some sectors. (IPCC, 2014).

For a country like Afghanistan, where approximately 75 per cent of the population is dependent on natural resources and agriculture, climate change can be disastrous because of its negative impacts on agriculture and primary food crops, such as wheat, maize, rice, fruits, etc. This module focuses on identifying the threats and impacts of climate change on water resources, agriculture and food production, biodiversity, and ecosystems like forests and rangelands. The impacts will be described in detail using concrete examples from the unique context of Afghanistan.

LEARNING OBJECTIVES

- Participants understand the main impacts of climate change on water resources, agriculture, biodiversity, and ecosystems.
- Students are able to describe the global changes in these sectors over the last few years through a case study.
- Students are able to apply their knowledge in mapping climate risks in their work areas through group exercise.

KEY DISCUSSION POINTS

- What are there main impacts of climate change on the water resources, agriculture, or biodiversity in Afghanistan?
- What changes have you noticed in your province over last years regarding climate and its impacts?
- In which ways is climate affecting livelihood, including climate extremes?

Impacts of Climate Change (3 Hours)

TEACHING RESOURCES:

- Lecture #2 (3 parts).1: *Impacts of Climate Change on Water Resources, Ecosystems, and Agriculture*
- 6-minute movie: *Earth´s Water Cycle (NASA, 2012)*
- 2-minute movie: *How Does Climate Change Affect Animals (DW, 2013)*
- 5-minute movie: *Hope in a Changing Climate (Liu, 2009)*
- Group exercise, discussion and mapping (including template maps of Afghanistan)
- Module evaluation form (Annex 5)

KEY READINGS

- Adams, R.M. & Peck. D.E. (2008). 'Effects of Climate Change on Water Resources.' *Choices*, 1st Quarter 2008-23(1), 12-14.
- IIED. (2014). *Ecosystem- and Community-based Adaptation*: Learning from Natural Resource Management. London: International Institute for Environment and Development.
- IPCC. (2014). Greenpeace Briefing: *What Does the IPCC WGII Report Say on Food and Agriculture?* Amsterdam: Greanpeace International.
- Mooney, K.N., & Gibb, C., (n.d.). *How are People Affecting Biodiversity?*
- Price, M.F. & Egan, P.A. (2014). *Our Global Water Towers*: Ensuring Ecosystem Services from Mountains Under Climate Change.
- UNEP. (2013). *The Social Dimensions of Ecosystem-based Adaptation.* UNEP Policy Series: Ecosystem Management. Policy Brief 12. Nairobi: United Nations Environment Programme.

MODULE GUIDANCE:

- Step 1. Present lecture #2 (part 1): *Impacts of Climate Change on Water Resources*
- Step 2: Show 6-minute movie: *Earth'sWater Cycle*
- Step 3: Present lecture #2 (part 2): *Impacts of Climate Change on Agriculture and Food Chain*
- Step 4: Show 2-minute movie: *How Does Climate Change Affect Animals*
- Step 6: Present lecture #2 (part 3): *Impacts of Climate Change on Biodiversity and Ecosystems*
- Step 7: Show 5-minute movie: *Hope in a Changing Climate*
- Step 8: Lead group discussion, or break into groups depending on number of students. Discuss impacts for Afghanistan. Discuss, to validate knowledge sharing via lecture. Participants will discuss impact of climate change (by providing practical examples) biodiversity, ecosystem, and agriculture.
- Step 8: Lead group discussion, or break into groups depending on number of students, to discuss main impacts for Afghanistan in all three sectors. Students will get a short introduction to the online resource "climatewizzard.org" and climate projections for Afghanistan including temperature and annual precipitation. Then each group will discuss the impact chain for one sector and shortly present it.
- Step 9: Distribute module evaluation form to students to complete and return to the instructor.

Climate Change Frameworks, Governance and Finance

MODULE 3

OUTLINE

In order to effectively address climate change, a combination of actions is required at all levels of governance, ranging from the international to national and community levels, with the objective of steering political, legal, and social systems to prevent, mitigate and adapt the climate change risks. Governance refers to the processes and systems of governing, specifically how decision-makers interact and are involved in the creation of institutions and the enforcement of decisions through laws, policies, or strategies. Climate change governance generally encompasses: 1) the relevant national government institutions that oversee sectors impacted by climate change (water, land, agriculture, etc.); 2) the climate change coordination mechanisms and structures between these institution; 3) national climate change policies, strategies, and plans; and 4) international multilateral environmental agreements (MEAs) that aim to build a global consensus to address the causes and impacts of climate change across all countries in the world.

This module provides a brief overview of global climate change frameworks as well as the current status of climate change governance in Afghanistan. This includes an overview of the major commitments that Afghanistan has made to the global community under the UNFCCC and its associated protocols and processes, as well as the global financial and technical resources available to Afghanistan to address its urgent climate change needs. This is followed by an introduction to the concept of mainstreaming climate change into Afghanistan's national development framework as an essential step towards increasing the country's adaptive capacity and ability to plan for and respond to the anticipated impacts of climate change. The key message here being that coordinated action is urgently needed among diverse partners and across numerous sectors to ensure that the risks of climate change are minimized and that development progress is not undermined.

LEARNING OBJECTIVES

- Students understand principles of climate change governance and global initiatives and agreements, including the MEAs to which Afghanistan is a Party.
- Students understand the various levels of climate change governance and diverse group of actors that should be involved for holistically addressing Afghanistan's climate change needs.
- Students are able to develop mechanisms to mainstream climate change into existing policies and plans.
- Students can develop a project concept (project identification form) for application to a global climate funding stream.

KEY DISCUSSION POINTS

- How much is climate change integrated into your agency's policies and plans?
- What type of mechanisms are in place for climate change governance in Afghanistan?
- What are the main sources of financial and technical resources available to Afghanistan for climate change?

Climate Change Frameworks, Governance and Finance (3 hours)

TEACHING RESOURCES:

- Lecture #3: *Climate Change Frameworks, Governance, and Finance*
- Group Competition (Questions and answers)
- 4-minute movie: *Learning to Address Climate Change (UNESCO, 2012)*
- 3-minute movie: *Global Landscape of Climate Finance (Climate Policy Initiative, 2013)*
- Module evaluation form (Annex 5)

KEY READINGS

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MODULE GUIDANCE:

- Step 1. Present lecture #3 (part1): *Climate Change Frameworks, Governance, and Finance.*
- Step 2: Group discussion: Using the World Bank's Interactive Map of CO2 Emissions, students collectively must identify the countries with the highest emission rates to understand the unequal responsibility of the global community towards causing and addressing climate change. Please refer to Annex 12 for more details.
- Step 3: Show 4-minute movie: *Learning to Address Climate Change.*
- Step 4: Present lecture #3 (part 2): *Climate Change Frameworks, Governance, and Finance.*
- Step 5: Group Activity: Divide students into two groups, and each group will be asked a set of 5 questions related to climate change governance. Once each group had completed answering questions they present their answers back to the whole group, and the group with the most correct answers wins the competition. Please refer to Annex 13 for more details.
- Step 6: Show 3-minute movie: *Global Landscape of Climate Finance.*
- Step 7: Lead group discussion, or break into groups depending on number of students, to brainstorm answers for "key discussion points." At the end, have students present their answers and allow the group to determine whether answers are sufficient or lacking any key details.
- Step 8: Distribute module evaluation form to students to complete and return to the instructor.

Climate Change Adaptation

MODULE 4

Climate Change Adaptation (3 Hours)

OUTLINE

Throughout history, people have adjusted to and coped with climate changes, variability, and extremes with varying degrees of success. Adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change (IPCC, 2014).

Afghanistan is highly vulnerable to natural hazards and the country's people have a long history of coping with and adapting to extreme climatic events and hazards. However, climate change is likely to exacerbate the impacts of these hazards on people and the environment, presenting greater challenges and difficulties to recover from and adapt to these events. Climate change is also a significant and growing threat in mountain areas that are more sensitive to changes in temperature and precipitation levels, which affects the environment as well as local people's livelihoods. The risks posed by climate change are dependent on several factors, including the specific weather and climatic events, local people's exposure and vulnerability to such events, and disaster risk reduction and preparedness. However, through effective planning, the exposure and vulnerability to these risks can be reduced. One approach, known as Ecosystem-based Adaptation (EbA), emphasizes the role of ecosystem services in order to help people adapt to the impacts of climate change. Thus, although climate change has the potential to aggravate the main drivers of risk and vulnerability, but their impacts can be reduced through EbA and environmental protection that ensures the continued provision of key ecosystem services.

LEARNING OBJECTIVES

- Students understand the concept of adaptation.
- Students are able to do discounting calculations for adaptation.
- Students understand ecosystem-based approaches to adaptation.
- Students are able to design basic adaptation strategies.

KEY DISCUSSION POINTS

- What are some adaptation techniques that you have used in your work up to now?
- Are there positive effects of climate change and if yes, how can Afghanistan make use of it?
- What are the linkages between climate change and risks posed by other natural hazards already occurring in Afghanistan?
- How can mitigation and adaptation be balanced? Are there trade-offs?

Climate Change Adaptation (3 Hours)

TEACHING RESOURCES:

- Lecture #4: *Adaptation to Climate Change*
- 19-minute movie: *Adapting in a Changing Climate (UNFCCC, 2014)*
- Group work and discussions
- Module evaluation form (Annex 5)

MODULE GUIDANCE:

- Step 1: Present lecture #4: *Adaptation to Climate Change.*
- Step 2: Show 19-minute movie: *Adapting in a Changing Climate.*
- Step 3: Lead group exercise on adaptation to Climate Change for different regions in Afghanistan: Central Highlands, North, Hindukush, East, and South. Students will discuss main threats and potential impacts. They will distinguish between different types of adaptation and given some information on climate change, including uncertainty, they will develop adaptation strategies for different sectors (agriculture, economy, infrastructure, natural hazards, and health). Finally groups will present the results. (approx.. 80 minutes) – *Please refer to Annex 10 for more information*
- Step 4: Distribute module evaluation form to students to complete and return to the instructor.

KEY READINGS

- CIGAR. (n.d.). Policy Brief: *Opportunities and Challenges for Climate-Smart Agriculture in Africa.*
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Climate Change Mitigation

MODULE 5

Climate Change Mitigation (3 Hours)

OUTLINE

Climate change mitigation refers to efforts to reduce or prevent emissions of Greenhouse Gasses (GHGs) in order to limit the impacts of climate change. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices and consumer behaviour. It can be as complex as a plan for a new city, or as a simple as improvements to a cook stove design. Efforts underway around the world range from high-tech subway systems to bicycling paths and walkways. Protecting natural carbon sinks like forests and oceans, or creating new sinks through silviculture or green agriculture are also elements of mitigation.

Despite the low levels of GHG emissions of Afghanistan, it is still important for the country to have knowledge and expertise on climate change mitigation in order to support the country's development. Various resources exist at international level that can provide support to climate change mitigation projects and initiatives in developing countries, such as Afghanistan, in an effort to promote increasingly sustainable and clean development.

This module will focus on identifying some of the main climate change mitigation approaches, including carbon sequestration and reduction, alternative energies, and improving energy efficiency. This module begins with an introductory overview of the basic knowledge and science of reducing GHG emissions in order to familiarize students with the underlying principles and approaches of climate change mitigation as a key aspect of addressing climate change. Next, principles of carbon sequestration and reduction are presented in order to provide students with knowledge about how to reduce, capture, store, and/or reuse carbon emissions. Particular emphasis is placed on the energy sector as a major source of GHG emissions, especially the combustion of fossil fuels, and the potential of alternative, renewable, and climate-smart energy technologies to transform the global environment.

LEARNING OBJECTIVES

- Students understand climate change mitigation and its importance to global efforts to reduce GHG emissions.
- Students understand how and why GHG emissions can be sequestrated.
- Students understand examples of best practices for reducing GHG emissions, including the utilization of innovative technologies, improving efficiency, etc.

KEY DISCUSSION POINTS

- What types of climate mitigation approaches can Afghanistan take urgently?
- How can Afghanistan improve and protect its carbon sinks?
- Will adapting renewable energy benefit Afghanistan? Or will it prove to be costly?
- How can Afghanistan efficiently adopt climate-smart energy technologies?

Climate Change Mitigation (3 Hours)

TEACHING RESOURCES:

- Lecture #5: *Climate Change Mitigation*
- 3-minute movie: *It's Time to Act on Climate Change* (By OECD)
- Student exercise and group activity
- Module evaluation form (Annex 5)

MODULE GUIDANCE:

- Step 1: Present lecture #5 (part 1): *Introduction to Climate Change Mitigation and Sequestration.*
- Step 2: Show 3-minute movie: *Its Time to Act on Climate Change.*
- Step 3: Group Activity: Lead a group discussion on the key messages from the movie, including asking students what they learned or think is applicable in the context of Afghanistan.
- Step 4: Present lecture #5 (part 2): *Alternative Energy Sources and Conservation.*
- Step 5: Lead group discussion, or break into groups depending on number of students, and brainstorm for mitigation options in Afghanistan as well as answers to the Key Discussion Points for this module.
- Step 6: Distribute module evaluation form to students.

KEY READINGS

- Pittock, B. (2009). Mitigation: Limiting Climate Change. In Pittock, B. (2009). Climate Change: *The Science, Impact and Solutions, 149-159 & 167-206. Collingwood: CSIRO.*

Climate-smart Technologies

MODULE 6

Climate-smart Technologies (3 Hours)

OUTLINE

Climate-smart technologies are vital to addressing climate change and have applications for both adaptation and mitigation. Thus, in developing countries, it is of great importance that climate-smart technologies be included in national development plans to ensure that GHG emissions are limited and development progress is not undone by climate-related hazards. In Afghanistan, knowledge of climate-smart technologies is relatively nascent; therefore, a first step is to raise awareness among key stakeholders and decision-makers about the potential benefits of such technologies as well as the global networks that can provide support and resources for the application and transfer of these technologies to Afghanistan.

Within this context, this module provides an introduction to climate-smart technology transfer, including its benefits and relevance to addressing urgent climate change needs, as well as existing global climate technology mechanisms that Afghanistan can currently access, such as the Climate Technology Centre and Network (CTCN).

The transfer of technologies between countries and communities is increasingly being recognized as a crucial step for building adaptive capacity and enhancing community-level ability to cope with the adverse impacts of clime change. Technology transfer has various definitions, but the Intergovernmental Panel on Climate Change (IPCC) has defined it as"…the broad set of processes that cover the flows of knowledge, experience, and equipment for mitigating and adapting to climate change among different stakeholders. These include governments, international organizations, private sector entities, financial institutions, NGOs and research and/or education institutions (IPCC, 2000)." Thus, this definition does not limit technology to only physical equipment, but also includes knowledge, experience and approaches, which are all valuable to building Afghanistan's adaptive capacity to climate change at the national, provincial, district, and community levels.

LEARNING OBJECTIVES

- Students are familiar with examples of climate technologies for both mitigation and adaptation.
- Students understand general principles of climate technology transfer.
- Students understand the global mechanisms to facilitate the transfer process of climate technologies.

KEY DISCUSSION POINTS

- Why is climate-smart technology important to addressing climate change?
- To what extent are climate technologies important for developing countries?
- How might climate-smart technologies be useful for Afghanistan?
- What is the CTCN and how can it be used and accessed in Afghanistan?

Climate-smart Technologies (3 Hours)

TEACHING RESOURCES:

- Lecture #6: *Climate Change Technologies*
- 2-minute movie: Smart *Climate Adaptation in Practice* (OECD)
- Student exercise and group activity
- Module evaluation form (Annex 5)

MODULE GUIDANCE:

- Step 1: Present lecture #6 (part 1): *Introduction to Climate-smart Technologies.*
- Step 2: Show 2-minute movie: *Smart Climate Adaptation in Practice.*
- Step 3: Group Activity: Lead group discussion on the key messages from the movie, including applicability of climate adaptation approaches in Afghanistan.
- Step 4: Present lecture #6 (part 2): *Climate Technology Centre and Network* (CTCN).
- Step 5: Group Activity: Lead group discussion, or break into groups depending on number of students, and brainstorm ideas for climate-smart technology options and transfer mechanisms in Afghanistan. If time permits, have students also brainstorm answers for "key discussion points." At the end, have students present their answers and allow the group to determine whether answers are sufficient or lacking any key details. *– Please refer to Annex 11 for more information*
- Distribute module evaluation form.

KEY READINGS

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- Ji, Z., Srinivas, K.R., & Kumar, N. (n.d.). 'Mechanisms for Enhancing Technology Development and Transfer.' In United Nations. (n.d.). *Climate Change: Technology Development and Technology Transfer,* 38-44. New York: UN.
- Moreira, R. & Sathaye, J. (n.d.). 'Technologies, Technology Transfer and Barriers.' In United Nations. (n.d.). *Climate Change: Technology Development and Technology Transfer*, 11-18. New York: UN.
- UNEP. (2015). *Factsheet: Technical Assistance - Climate Technology Centre and Network*. Kabul: UNEP.

Workshop: Prioritization of Climate-sound Technologies for the Agriculture, Energy and Water Sectors

MODULE 7

OUTLINE

This module is a practical session that has been developed for application of the knowledge learned from the previous six taught modules, ranging from the knowledge on climate change science, its impacts, global and national frameworks and responses to it through climate-sound technologies for both adaptation and mitigation measures.

Climate-sound technologies play a crucial role in addressing climate change impacts through immediate and long-term adaptation and mitigation measures. These measures could be more efficient through new technologies and innovations. Financial resources, capacity building and technology transfer, are three key needs of developing countries to address climate change, which is known internationally and constitutes a significant part of global climate change negotiations.

Afghanistan is consistently ranked among the most vulnerable countries to climate change impacts, particularly in the water, agriculture and energy sectors. Both, adaptation and mitigation technologies are for short- and long-term planning are required in the mentioned sectors to cope with the existing and projected impacts of climate change. In 2014, Afghanistan applied for "Technical Assistance" from the CTCN in order to identify the prioritized and relevant climate-sound technologies in the mentioned sectors.

This practical workshop will review the developed list of climate-sound technologies, prioritization criteria, advocacy paper, and a project concept for feedback, and will prioritize the most relevant and crucial technologies for the energy sector. This practical workshop will allow participants to see the "Mini-Technology Need Assessment" process in action, and they will also tangibly contribute to the identification of priority climate-sound technologies.

LEARNING OBJECTIVES

- Students are able to identify important climate mitigation and adaptation technologies.
- Students are familiar with the "Mini-Technology Need Assessment" Process.
- Students are more familiar with Climate-sound technologies.
- Students are familiar with ongoing national processes in terms of Climate Change.

KEY DISCUSSION POINTS

- How is the CTCN Technical Assistance progress?
- What are the key climate-sound technologies in Energy, Agriculture and Water sectors?
- What are the criteria to prioritize climate-sound technologies?
- What are the prioritized climate technologies for Water, Energy and Agriculture Sectors?

Workshop: Prioritization of Climate-sound Technologies for the Agriculture, Energy and Water Sectors

TEACHING RESOURCES:

- List of the climate-sound technologies; (to be distributed in the workshop)
- List of criteria developed for climate-sound technologies; (to be distributed in the workshop)
- The Technology Need Assessment Handbook.
- Post training Assessment

MODULE GUIDANCE:

- Step 1: Students join the national workshop on CTCN Technical Assistance (TA) and are provided with a short presentation on the background and history of Afghanistan's CTCN TA.
- Step 2: Distribute to all workshop participants supporting documents for the CTCN TA, including the list of technologies, criteria, and concept note and will be shared with participants;
- Step 4: Collectively, workshop participants review and discuss these documents and provide feedback to the workshop organizers.
- Step 5: Using the established criteria already distributed to workshop participants, a short-list of climate technologies will be prioritized.
- Step 6: Afterwards, a project concept note will be reviewed and discussed by the workshop participants to gain their feedback and build the foundation for next steps of implementation.
- Step 7: Wrap-up of the workshop.
- Step 8: A post-evaluation form will be distributed for the students.

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Annex 1: Terminology

Acceptable Risk:
The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions (UNISDR, 2009).

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 may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacities are the positive factors that increase the ability of people and the society they live in, to cope effectively with hazards, that increase their resilience, or that otherwise reduce their susceptibility to disasters (UNISDR, 2009).

Climate Change:
Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use. (IPCC, 2012)

Climate Change 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. Various types of adaptation exist, e.g. anticipatory and reactive, private and public, and autonomous and planned (IPCC, 2012).

Climate Change Mitigation:
A human intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2012).

Climate Variability:
Variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability) (IPCC, 2012).

Coping Capacity:
The ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters. This capacity may differ according to demography, location, gender and other factors. The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during crises or adverse conditions. Coping capacities contribute to the reduction of disaster risks (UNISDR, 2009).

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. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and

insufficient capacity or measures to reduce or cope with the potential negative consequences (UNISDR, 2009).

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 (UNISDR, 2009).

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 (UNISDR, 2009).

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 (UNISDR, 2009).

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 (UNISDR, 2009).

Ecosystem:
A dynamic complex of micro-organism, plant, animal and human communities and their non-living environment interacting as a functional unit (Millennium Ecosystem Assessment, 2005).

Ecosystem Services:
The benefits that people and communities obtain from ecosystems. These include "regulating services" such as regulation of floods, drought, land degradation and disease, along with "provisioning services" such as food and water, "supporting services" such as soil formation and nutrient cycling, and "cultural services" such as recreational, spiritual, religious and other non-material benefits. Integrated management of land, water and living resources that promotes conservation and sustainable use provide the basis for maintaining ecosystem services, including those that contribute to reduced disaster risks (Millennium Ecosystem Assessment, 2005; UNISDR, 2009).

Emergency Management:
The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps (UNISDR, 2009).

Environment:
The complex of physical, chemical, and biotic factors (such as climate, soil, and living things) that act upon individual organisms and communities, including humans, and ultimately determine their form and survival. It is also the aggregate of social and cultural conditions that influence the life of an individual or community. The environment includes natural resources and ecosystem services that comprise essential life-supporting functions for humans, including clean water, food, materials for shelter, and livelihood generation (WWF –US and American Red Cross, 2010).

Annex 1: Terminology

Environmental Degradation:
The reduction of the capacity of the environment to meet social and ecological objectives and needs. Degradation of the environment can alter the frequency and intensity of natural hazards and increase the vulnerability of communities. The types of human-induced degradation are varied and include land misuse, soil erosion and loss, desertification, wildland fires, loss of biodiversity, deforestation, mangrove destruction, land, water and air pollution, climate change, sea level rise and ozone depletion (UNISDR, 2009).

Exposure:
People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses. Measures of exposure can include the number of people or types of assets in an area (UNISDR, 2009).

Greenhouse Gases (GHGs):
Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds (UNISDR, 2009).

Hazard:
A dangerous phenomenon, substance, human activity or condition 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. Hazards arise from a variety of geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. Natural hazards are natural processes or phenomena, such as earthquakes, droughts and tropical cyclones, but their occurrence and scale of impact are often influenced by human-induced activities such as inappropriate land use, poor building codes and environmental degradation (UNISDR, 2009; Estrella and Saalismaa, 2010).

Impacts:
Effects on natural and human systems. In this report, the term 'impacts' is used to refer to the effects on natural and human systems of physical events, of disasters, and of climate change (IPCC, 2012).

Land-use Planning:
The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses (UNISDR, 2009).

Natural Resource:
Natural resources are actual or potential sources of wealth that occur in a natural state, such as timber, water, fertile land, wildlife and minerals. A natural resource qualifies as a renewable resource if it is replenished by natural processes at a rate comparable to its rate of consumption by humans or other users. A natural resource is considered non-renewable when it exists in a fixed amount, or when it cannot be regenerated on a scale comparative to its consumption (Estrella and Saalismaa, 2010).

Preparedness:
The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to

Annex 1: Terminology

effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions (UNISDR, 2009).

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. Resilience means the ability to "resile from" or "spring back from" a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need (UNISDR, 2009). We can also consider resilience as the "ability to bounce forward", which implies not just returning to the initial state as before a shock but improving from that initial state (Manyena et al., 2011).

Risk:
The combination of the probability of an event and its negative consequences (UNISDR, 2009).

Sustainable Development:
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNISDR, 2009).

Sustainable Ecosystem:
Imply that ecosystems are largely intact and functioning, and that human demand for ecosystem services does not impinge upon the capacity of ecosystems to maintain future generations. (Sudmeier-Rieux, K. & N. Ash, 2009).

Transformation:
The altering of fundamental attributes of a system (including value systems; regulatory, legislative, or bureaucratic regimes; financial institutions; and technological or biological systems). (IPCC, 2012)

Vulnerability:
The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Vulnerability arises from various physical, social, economic, and environmental factors, such as poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. The losses caused by a hazard will be proportionally much greater for more vulnerable populations, e.g. those living in poverty, with weak structures, and without adequate coping capacities (UNISDR, 2009).

Annex 2: Supplementary Readings and Resources

Module 1: Introduction to Climate Change Science

IPCC (2007a). Climate Change 2007: *The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge: Cambridge University Press. URL: https://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm

IPCC (2007b). "Summary for Policymakers." *In Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge: Cambridge University Press. URL: https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf

Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather, 2007: Historical Overview of Climate Change. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch1.html

World Bank Datasets data.worldbank.org

Global Open Source risk assessment for humanitarian crises and disasters http://www.inform-index.org/The links of Climate change and disasters http://earthobservatory.nasa.gov/Features/RisingCost/rising_cost5.php\

Evidenced based Climate Change Science, https://royalsociety.org/~/media/Royal_Society_Content/policy/projects/climate-evidence-causes/climate-change-evidence-causes.pdf

Module 2: Impacts of Climate Change

CAMP Alatoo. (2013). *Climate Risk Assessment Guide – Central Asia.* (Available Online at: http://cdkn.org/wp-content/uploads/2013/08/Climate-Risk-Assessment- Guide.pdf) Accessed: 24 April 2016

IPCC. (2008) *Climate Change and Water.* (Available Online at: https://www.ipcc.ch/publications_and_data/_climate_change_and_water.htm) Accessed: 24 April 2016

USGS (2010) *Climate Change and Water Resources Management:* A Federal Perspective, (Available online at: http://pubs.usgs.gov/circ/1331/Circ1331.pdf). Accessed: 24 April 2016

UNWATER: Climate Change Adaptation: The Pivotal Role of Water, (Available online at: http://www.unwater.org/downloads/unw_ccpol_web.pdf). Accessed: 24 April 2016

UNESCO. (n.d). *The Impact of Global Change on Water Resources.* (Available online at: http://unesdoc.unesco.org/images/0019/001922/192216e.pdf). Accessed: 24 April 2016

Module 3: Climate Change Frameworks, Governance and Finance

Afghanistan (2012). *Initial National Communication under the UNFCCC.* Kabul : National Environmental Protection Agency. URL: http://unfccc.int/resource/docs/natc/afgnc1.pdf

Afghanistan (2015). *Intended Nationally Determined Contribution.* Kabul: National Environmental Protection Agency. URL: http://www4.unfccc.int/submissions/INDC/Published%20Documents/Afghanistan/1/INDC_AFG_Paper_En_20150927_.docx%20FINAL.pdf

UNFCCC. *Brief Overview of UNFCCC Decisions* http://unfccc.int/documentation/decisions/items/2964.php

UNFCCC (2002). *A Guide to the Climate Change Convention Processes* http://unfccc.int/resource/process/guideprocess-p.pdf

UNFCCC (2006). UNFCCC Handbook unfccc.int/resource/docs/publications/handbook.pdf

Handbook for the Vienna Convention for the Protection of the Ozone Layer – 12th Edition http://e-learning.informea.org/mod/url/view.php?id=32

FIELD (2011). Help for MEA Negotiators Who Encounter Problems

UNFCCC (2006). UNFCCC Handbook

CDDE and UNDP (2012). Making Sense of Climate Finance

UNDP (2011). Formulating Climate Change Scenarios to Inform Climate-Resilient Development Strategies

Module 4: Climate Change Adaptation

Worldbank (2014). Turn Down the Heat: Confronting the New Climate Normal. (Available online at: https://openknowledge.worldbank.org/bitstream/handle/10986/20595/9781464804373.pdf?sequence=3&isAllowed=y) Accessed: 24 April 2016

UNEP. (2013). *The Social Dimension of Ecosystem-based Adaptation.* (Available online at: http://www.unep.org/ecosystemmanagement/Portals/7/Documents/policy_series_12-small_Nov_2013.pdf). Accessed: 24 April 2016

Department of Defense. (2014). *2014 Climate Change Adaptation Roadmap,* (Available online at: http://ppec.asme.org/wp-content/uploads/2014/10/CCARprint.pdf). Accessed: 24 April 2014.

Module 5: Climate Change Mitigation

Pittock, B (2009). *Climate Change: The Science, Impact and Solutions*. Collingwood: CSIRO.

IPCC. (2014). 'Summary for Policymakers.' In IPCC. (2014). *Climate Change 2014, Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge & New York: Cambridge University Press.

Camarsa, G., Toland, J., Hudson, T., Nottingham, S., Jones, W., Eldridge, J. , Thévignot, C. (2015). *Life and Climate Change Mitigation.* Luxembourg: Publications Office of the European Union

Chandler, W., Schaeffer, R., Dadi, Z., Shukla, P.R., Tudela, F., Davidson, O. & Alpan-Atamer, S. (2002). *Climate Change Mitigation in Developing Countries: Brazil, China, India, Mexico, South Africa, and Turkey.* Arlington: Pew Center on Global Climate Change

OECD. (2008). *Climate Change Mitigation: What Do We Do.* (n.c.): OECD

OECD. (2015). *It's Time to Act on Climate Change.* (Available at: https://www.youtube.com/watch?v=Wkr501nu3NA, accessed: 24 April 2016)

Module 6: Climate-smart Technologies

United Nations (n.d.). *Climate Change: Technology Development and Technology Transfer*. New York: UN

UNEP. (2015). *Factsheet: Technical Assistance - Climate Technology Centre and Network.* Kabul: UNEP.

Pittock, B (2009). *Climate Change: The Science, Impact and Solutions, 149-159*. Collingwood: CSIRO.

Fisher, C. & G. Newell, R. (2007). *Environmental and Technology Policies for Climate Mitigation.* Washington, DC: Resources for the Future.

M. Hoekman, B., E. Maskus, K., Saggi, K. (2004). *Transfer of Technology to Developing Countries: Unilateral and Multilateral Policy Options*. Boulder: IBS

UNDP. (2010). *Hand for conducting: Technology Needs Assessment for Climate Change*. New York: UNDP

IPCC. (2014). 'Summary for Policymakers.' In IPCC. (2014). *Climate Change 2014, Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge & New York: Cambridge University Press.

CTCN. *Climate Technology Centre & Network.* (Available at: www.ctc-n.org, accessed: 24 April 2016)

OECD. (2015). *Smart Climate Change Adaptation in Practice*. (Available at: https://www.youtube.com/watch?v=oshaiU70HOo, accessed: 24 April 2016)

Annex 2: Supplementary Readings and Resources

SPEAK Climate: From Science to Action
30 April – 3 May 2016

UNEP

Name: Date:

#	Question	Answer
1	What is the Climate Change?	
2	What are the causes of climate change?	
3	What is Green House Gases?	
4	Does climate change have any impact on biodiversity and ecosystems? If so, what are those?	
5	Does climate change have any impact on agriculture? If so, what are those?	
6	Does climate change have any impact on water resources? If so, what are those?	
7	What is climate change adaptation?	

#	Question	Answer
8	What is climate change mitigation?	
9	What are climate technologies?	
10	Have Afghanistan government produced any policy and strategy to adapt to or mitigate climate change? If yes, please name up to three of them.	
11	Is there any global framework for climate change governance? If there is, please name them?	
12	What does mainstreaming means in climate change issues?	
13	Which government institutions are mainly leading climate change governance in the country? Name up to three only.	
14	What role do local communities have in Climate Change Adaptation and Mitigation?	
15	What is CTCN?	

Annex 4: Post-Training Assessment

SPEAK Climate: From Science to Action
30 April – 3 May 2016

UNEP

Name: Date:

#	Question	Answer
1	What is the Process to access Technical Assistance of CTCN? Name the steps:	
2	Identify three key Climate-Sound technologies for Energy Sector based on the prioritization criteria.	
3	What criteria needs to be considered for prioritization of climate-sound technologies?	
4	Name top three outcomes from the SPEAK Climate Training?	
5	How can energy conservation respond to climate change?	
6	What is more relevant to Afghanistan climate change context: Mitigation or Adaptation? Why?	
7	Name three Financial Mechanisms that Afghanistan can access?	
8	What parts of SPEAK Climate training were used in today's activities?	
9	Name top three impacts of climate change in Afghanistan? And provide mitigation and adaptation measures for each.	
10	Name top 4 vulnerable sectors to climate change impacts.	

Annex 5: Module Evaluation Form

We kindly ask you to answer the following questions to help improve the quality of *Climate change from Science to Action in Afghanistan* training course. Please take a few minutes to complete this questionnaire. The questionnaire is anonymous.

Training course title: Module title:

Instructor's name: Date:

In the table below please evaluate the module you have just completed:

5-Excellent, 4-Good, 3-Satisfactory, 2-Bad, 1- Very bad.

Indicator	5	4	3	2	1	Comments (if you put high mark or low mark please explain why)
Quality of classrooms, equipment (Clean rooms, class equipment, good lightning, etc...)						
Usefulness/Applicability of skills and course taught (Interesting; useful in future or now, clear)						
Content (5-large range of themes, 4-enough, 3-almost all, 2-little, 1- not enough)						
Time allocation for the course (5- more than enough, 4- enough, 3-almost enough, 2-little, ready to pay for additional hours, 1-increase course cost and length)						
Quality of leaning materials (Useful, covers all topics, actual, will use in future)						

In the table below please evaluate the Instructor:

Indicator	5	4	3	2	1	Comments (if you put high mark or low mark please explain why)
Knowledge of the material and concepts taught (Instructors answers questions, gives examples, is aware of facts)						
Instructor's ability to explain material (Explains well and in interesting way, you clearly understand)						

Annex 5: Module Evaluation Form

Teaching style of instructor (5 - excellent, 4 - good, 3 - almost good, 2 - bad, 1 - poor)						
Ability to communicate with audience						
Quality of the knowledge received						
Fairness and respect of instructor toward all student (Respect, friendliness, fairness)						

What difficulties/problems did you have during the course or training?

_____

_____

What would you recommend for course and programs improvement?

_____

_____

Would you like to receive further training in biodiversity conservation issues? _____(yes/no), if yes, what course? _____

Will you recommend this programs and courses to other people? _____(yes/no)

Annex 6: Training Participant Feedback Form

Training Participant Feedback Form:

Title of Training:

Date:

A. How would you rate your knowledge of this subject prior to this training?

1 (Low)	2	3	4	5	6	7	8	9	10 (High)

Comments:

B. How would you rate your knowledge of this subject after training?

1 (Low)	2	3	4	5	6	7	8	9	10 (High)

Comments:

C. How would you rate the training materials?

1 (Low)	2	3	4	5	6	7	8	9	10 (High)

Comments:

D. How would you rate the trainer(s)?

1 (Low)	2	3	4	5	6	7	8	9	10 (High)

Comments:

E. How would you rate the timing allocated for this training?

1 (Low)	2	3	4	5	6	7	8	9	10 (High)

Comments:

Annex 6: Training Participant Feedback Form

F. What did you like most about the training?

G. What changes would you recommend to the training?

H. Would you recommend this training to other colleagues or partners? Why or why not?

I. How you will apply the knowledge and skills that you learned during this training in your work?

J. Do you have any additional comments or suggestions?

Annex 7: Module Reflection and Revision Form

Annex 7. Module Reflection and Revision Form

Training course name	
Module name	
Date delivered	
Participants (# of participants, knowledge level, capacity overview, etc.)	
Module Learning Objective(s)	
Challenges (were there any challenges with the delivery of the module?)	
How was the module or activities adapted for the participants?	
Recommendations for module improvement?	

Module 1: Case Study – Climate Change and Gender

The objective of this case study is for students to learn from an international experience of the Mama Watoto (Mother of Children) Group has been working on climate change, biodiversity and gender in Swahili for over twenty years.

Instructions:

Activity 1: Divide the students into two groups. Give handouts of Direct risks to group 1 and Indirect risks to group 2 and:

- Appoint a leader in each group;
- Ask the groups to discuss the information given and provide answers to following questions:
- Do people have similar or equal conditions in which to address and adapt to climate change?
- Do they have the same skills and capabilities to confront it?
- Will the consequences of climate change affect all people equally?
- Finally, ask the participants what they have learned from the assignment.

Activity 2: Divide the students in four groups each representing four regions of the country (North, South, East, and West).

- Ask students to identify the direct risks of climate change in Afghanistan and their examples in the country using the same table format that is provided in the previous case study.
- Once completed, each group will report back to the whole class on their findings.

Handout1: Direct risks of Climate Change and their potential effect on women		
Potential Risks	**Examples**	**Potential effect on Women**
Increased ocean temperature	Rising incidence of coral bleaching due to thermal stress	Loss of coral reefs can damage the tourism industry, a sector in which women comprise 46% of the workforce.

Handout1: Direct risks of Climate Change and their potential effect on women		
Increased drought and water shortage	Morocco had 10 years of drought from 1984 to 2000; northern Kenya experienced four severe droughts between 1983 and 2001.	Women and girls in developing countries are often the primary collectors, users and managers of water. Decreases in water availability will jeopardize their families' livelihoods and increase their workloads, and may have secondary effects such as lower school enrolment figures for girls or less opportunity for women to engage in income-generating activities.
Increased extreme weather events	Greater intensity and quantity of cyclones, hurricanes, floods and heat waves.	In a sample of 141 countries over the period 1981–2002, it was found that natural disasters (and their subsequent impact) on average kill more women than men or kill women at an earlier age than men.
Handout2: Indirect risks of Climate Change and their potential effect on women		
Potential Risks	**Examples**	**Potential effect on Women**
Increased epidemics	Climate variability played a critical role in malaria epidemics in the East African highlands and accounted for an estimated 70% of variation in recent cholera series in Bangladesh	Women have less access to medical services than men, and their workloads increase when they have to spend more time caring for the sick. Poorer households affected by HIV/AIDS have fewer resources to adapt to climate change impacts. Adopting new strategies for crop production or mobilizing livestock is harder for female-headed and infected households.
Loss of species	By 2050, climate change could result in species extinctions ranging from 18–35%.	Women often rely on crop diversity to accommodate climatic variability, but permanent temperature change will reduce agro-biodiversity and traditional medicine options, creating potential impacts on food security and health.
Decreased crop production	In Africa, crop production is expected to decline 20–50% in response to extreme El Niño-like conditions.	Rural women in particular are responsible for half of the world's food production and produce between 60-80% of the food in most developing countries. In Africa, the share of women affected by climate- related crop changes could range from 48% in Burkina Faso to 73% in the Congo.

Annex 9: Module 2 - Impacts of Climate Change Activity

Objective:

The goal of the groupwork is to repeat the learned lessons and apply the general knowledge for Afghanistan.

Instruction:

1. Build 3 groups
2. Introduce the Internet portal http://www.climatewizard.org/ if possible (short introduction on usage: Change to global, and look for Afghanistan, see if precipitation and temperature change in their region) and show the projected changes for Afghanistan: Temperature increase, precipitation high uncertainty, spring rains might decrease in some areas. (10 minutes)
3. Each group should discuss the impacts for Afghanistan for all three introduced sectors (10 minutes). Potential questions to break the ice:
    a. What are their personal experiences with climate change
    b. Do they think that developed countries are also impacted?
4. Then the groups should come up with an impact chain for one of the sectors on a flipchart (e.g. temperature increase -> water stress -> lowering of agricultural production -> poverty -> migration -> social instability... (10 minutes)
5. Groups present the outcome (3 minutes each -> 10 minutes)

Annex 10: Module 4 - Climate Change Adaptation Activity

Objective:

The goal of the groupwork is to repeat the learned lessons and apply the general knowledge for Afghanistan.

Instruction:

1. Build 5 groups according to these regions in Afghanistan: Central Highlands, North, Hindukush, East, South. (if not enough people less groups, min. 3 persons)
2. Discuss main impacts (chain) of climate change to the region, inform them that precipitation is highly uncertain and temperature will increase strongly (10 minutes).
3. Then the groups discuss on impacts of the climate on sectors and possible adaptation options, with special emphasis on eco-based adaptation and write them on piece of papers and sort the adaptation measures according to their timeframe (x-axes) and cost (y-axes) (20 minutes)
4. Groups develop an adaptation plan for their region with an emphasis on the agricultural sector, using the measures from before. The adaptation plan should particularly take into account measures that are also applicable under high uncertainty. (low-regret measures, win-win measures, reversible and flexible measure, reduce time horizon). (20 minutes)
5. Groups present the outcome and answer questions (3+2 minutes each -> 30 minutes)

Annex 11: Group Work for Identifying Climate-Sound Technologies

Objective:

The goal of the group work is to repeat the learned lessons and apply the general knowledge for Afghanistan.

Instruction:

1. Build 3 groups according to the following sectors: Agriculture, Water, and Energy.
2. Discuss main impacts of climate change in each sectors. (15 minutes)
3. Brainstorm on the possible climate-sound technologies for adaptation and mitigation for each sectors. (20 minutes)
4. Groups present the outcome and answer questions. (15 minutes)

Annex 12: Climate Data Analysis Practice

This activity will give students hand-on experience of using climate data for analysis.

Instructions:

1. Open http://data.worldbank.org/
2. Show students various data analysis options such as by country, by indicators, by tables, by maps, etc.

Annex 13: Climate Governance Question and Answer Competition

The objective of this activity is for participants to revise the technical climate change governance jargon.

Instructions:

Step 1: Divide the participants to two groups.

Step 2: Ask the groups to select one set of questions and match answers to the relevant questions.

Questions Set 1:

No.	Questions	Answers
1	UNFCCC	International Convention on Climate Change
2	NAMA	Mitigation Actions Planned by a Country
3	NAP	Plans to implement Adaptation actions
4	Kyoto Protocol	International Agreement to reduce GHG emissions over a period of time
5	IPCC	Organization that reviews and assesses climate data
6	ANNEX 1 Parties	Group of 43 developed countries, that were part of the OECD in 1992, and countries with economies in transition (EIT)
7	Annex 2 Parties	Group of 23 developed countries but not countries with EIT (subset of Annex I countries)
8	Non-Annex 1 Parties	Report on mitigation and adaptation actions Submit national communications and biennial update reports (BURs)
9	REDD	Programme oriented towards reducing the emissions from forestry
10	CTCN	Network that facilitates the technology transfer mechanism

Questions Set 2:

11	GEF	Organization managing the funds for the UNFCCC implementation
12	COP	Supreme Body of the Climate Convention
13	INC	Initial National Communications
14	SCCF	Special Climate Change Fund
15	LDCF	Least Developed Countries Fund
16	AF	Adaptation Trust Fund
17	CDM	Clean Development Mechanism
18	LECRDS	Low-Emission Climate- Resilient Development Strategy
19	GCF	Green Climate Fund
20	GHG	Green House Gases