Module 1: Climate Change and Disaster Risk Management

Introduction

This Module explains key concepts relating to climate change and disaster risk management and presents an overview of the related international frameworks. In Module 2, we will explore the factors causing the climate to change and its impacts on landscapes with specific reference to Afghanistan.

Climate Change

The global climate has always been changing but there is strong scientific consensus that since the industrial revolution, human actions have become a significant contributing factor. This is called 'anthropogenic climate change' and it involves greenhouse gas (GHG) emissions from energy production, industry, transport, agriculture and other sectors[1]. Rising concentrations of GHGs in the atmosphere lead to global temperature rise. Higher temperatures, in turn affect the climate, the global water cycles; snow and glaciers melt, sea levels, rain patterns and the occurrence of extreme weather events (see also modules 2 and 3).

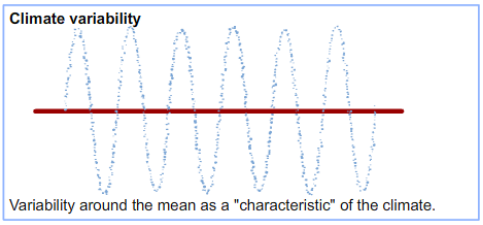
Mitigation and adaptation are the two key strategies to address climate change. They are complementary and non-exclusive. **Adaptation** is the process of adjustment to actual or expected climate and its effects. Adaptation seeks to moderate negative impacts and to exploit beneficial opportunities where possible**. Mitigation** refers to interventions to reduce the sources or to enhance the sinks of greenhouse gas emissions[2].

Box 1: Climate change and climate variability

Climate change refers to a **long-term change in the state of the climate**, which can be identified by changes in the mean and/or in the variability. In contrast, **climate variability** refers to the natural variations of the climate. The UN Intergovernmental Panel on Climate Change (IPCC) refers to climate change as "any change in climate over time, whether due to natural variability or as a result of human activity".

Climate variability

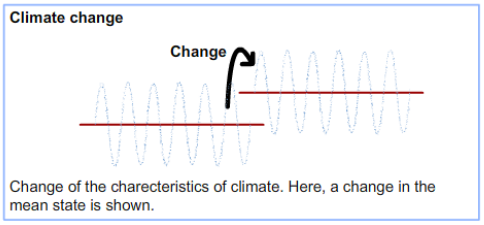
Climate variability refers to **variations of the climate**
- in the mean state, and
- in other statistics, such as standard deviations and the occurrence of extremes.



Climate change

Climate change refers to a long-term **change in the state of climate**, that can be identified by changes in the means and/or changes in the variability.

Climate change also includes **gradual** and/or **abrupt** changes of the frequencies and intensities of extreme events.



Source: FAO, 2012: Planning for community-based adaptation to climate change (e-learning tool)

[1] WMO, 2013: A summary of current climate change findings and figures, WMO information note, November 2013.
[2] In the context of disaster risk management, mitigation refers to reducing or limiting the adverse impacts of hazards. While the idea of reduction of GHGs is similar, the concept of 'sinks' is specific to climate change.

Disaster Risk Management

Disaster risk management (DRM) aims to systematically avoid (prevent) and limit (prepare/mitigate) disaster risks with regard to loss in lives, social, economic and environmental assets of communities and countries. Disaster risk management is the application of policies, processes and actions to prevent new risks, reduce existing risks and manage residual risks contributing to the strengthening of resilience[3] (Figure 1).

Figure 1: Disaster risk management cycle (Swiss Government, 2014)

Poverty and inequality often push women and men to live in marginalised places that are risky, such as alongside rivers, in floodplains, marginal lands or slopes. Other drivers are population growth and migration, particularly evident in cities where high population density, inadequate urban planning and poor infrastructure lead to a concentration of risks. Climate change is now an important additional driver of disaster risks.

A disaster can be rapid or slow onset (see Module 8). Disaster events tend to increase in intensity and frequency due to climate change and have a higher impact on the most vulnerable. It is estimated that climate change impacts and related disasters could push back over 100 million women and men into poverty in the next 15 years despite major gains in poverty reduction.[4]

Climate change and disaster risk management

Disaster risk is composed of three elements: hazard, exposure and vulnerability (see Figure 2).

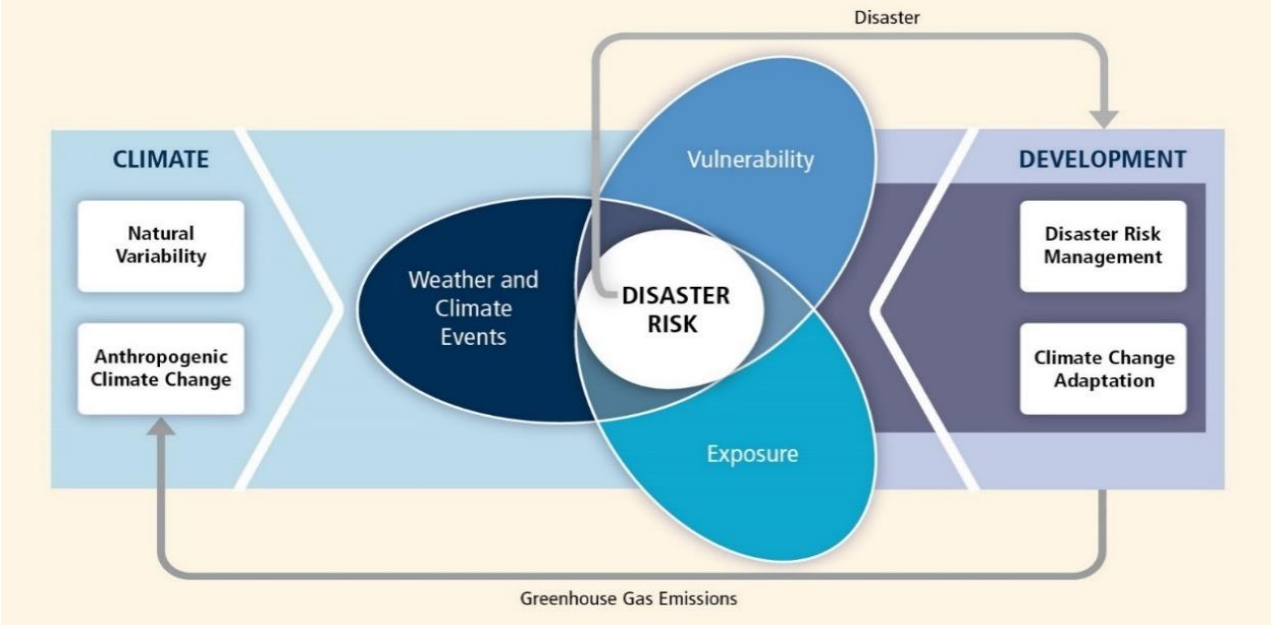


Figure 2: The risk of disaster depends on three elements - the hazard, vulnerability and exposure to this hazard (IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change)

Hazard is the potential occurrence of a harmful event (hydro-meteorological, geophysical or biological) that may cause loss of life, injury or other health impacts, as well as damage and loss of property, infrastructure and

[3] UNISDR, 2015: Proposed updated terminology on disaster risk reduction: a technical review (August 2015)
[4] Hallegatte S. et al., 2016: Shock waves: managing the impacts of climate change on poverty. Climate change and development series. World Bank, Washington DC

natural resources. **Exposure** is defined as the presence of people, assets and resources in places that could be adversely affected. **Vulnerability** is the propensity or predisposition to be adversely affected. **Capacity** refers to all the resources available to an individual, community, society or organisation to reduce vulnerability and deal with the consequences of disasters. Among families, communities and regions there are differences in vulnerability, exposure and capacity. When a hazard interfaces with exposure and vulnerability, it results in a disaster. The extent of the disaster risk is moderated by the capability of the community or system. As can be seen from Figure 2, climate – both its natural variations and anthropogenic climate change – influences the degree of disaster risks. The level of development and the nature of development interventions also influence the degree of risks.

Whilst all countries suffer from disasters, the loss of lives due to disasters is largely concentrated in developing countries, while loss of assets in developed countries. For instance, during the period from 1970 to 2008, over 95 percent of deaths from natural disasters occurred in developing countries[5]. While natural hazards cannot be fully avoided, disasters can, to a large extent, be avoided by reducing the exposure of communities to the hazard, increasing their capacities to withstand it and/or by reducing their vulnerability. In sum, disasters are not purely the results of shocks, stresses and hazardous events, but the product of social, political and economic context in which they occur.

Why climate change and disaster risk management in development cooperation?

Poverty and vulnerability to disasters are closely linked: low-income countries and, within them, the poorest and most disadvantaged groups are typically at greatest risk and disproportionately affected by disasters.

In Afghanistan, flash floods and droughts are the major hazards causing substantial damage each year (Figure 3). Economic losses due to droughts and floods in Afghanistan are estimated at around US$ 16,705 Mio between 2005 and 2014. It is important to underline that smaller but more frequent events – extensive disasters – are not included in the national statistics although they have a debilitating effect on the poor.

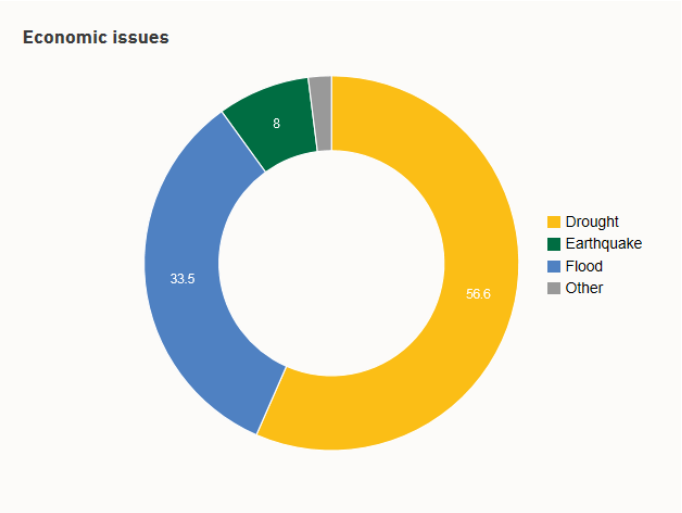


Figure 3: Economic losses by hazard types between 2005-2014 in Afghanistan (PreventionWeb)

Disasters are setbacks to development and can destroy decades of progress. Poverty reduction, adaptation to climate change and DRM are closely interlinked and interdependent objectives, and hence must be addressed jointly. **Integrated Risk Management** is a useful approach to contribute to resilience building by adapting to climate change, limiting disaster risks, reducing poverty and improving livelihoods.

International frameworks

Climate Change

The **United Nations Framework Convention on Climate Change** (UNFCCC) is the international agreement that was opened to signature in June 1992 during the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro and came into force in March 1994. The Convention's goal is to stabilise atmospheric concentrations of GHG concentrations in the atmosphere '*at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner*' (UN, 1992).

The Intergovernmental Panel on Climate Change (IPCC) is the international scientific body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World

[5] 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

Meteorological Organization (WMO) in 1988. The IPCC publishes periodic Assessment Reports (five reports to date) based on existing scientific literature on climate change.

Box 2: Gender and social equity in the context of climate change and disaster risk management

"Thanks to our disaster management training 10 days before the earthquake, we were able to respond quickly to the earthquake: rescuing many from debris of collapsed houses and provide them with first aid."
A woman from Batangian village in North-West Frontier Province (NWFP), Pakistan.

Disasters result when hazards impact vulnerable communities. The degree of vulnerability, and thereby the impact of a disaster, is defined by social variables such as gender, age, health status, ethnicity, religion and socio-economic status. In this sense, impacts of climate change and disasters affect women and men in different ways owing to their distinct roles.

First impacts of climate change are felt through extreme events where women and men have different degrees of exposure, vulnerability and therefore risk. For instance, in societies where the place of women is restricted to the private and reproductive sphere, survival skills are taught more to boys than to girls. While access to information and education on climate and disaster related issues are essential to face up to them, women rarely receive information on the subject. Their capacity to respond is therefore lower. Hence, it is vital to offer special trainings to women as shown in the example of Pakistan. Another example is the fact that women in many societies, particularly in Asia and Africa, are handicapped in escaping floodwaters because they cannot swim (learning to swim being taboo), and/ or because they are weighed down by heavy clothing to "preserve their modesty". It was widely reported after the 2005 tsunami that women accounted for up to 80% of the deaths in some areas (particularly in Indonesia and Sri Lanka).

When it comes to climate variability and change, women are also particularly vulnerability, as women tend to have more limited access to resources that would enhance their capacity to adapt to climate change — including land, credit, agricultural inputs, decision making bodies, technology and training services. Vulnerability depends in large part on the assets (physical, financial, human, social, and natural) available: the more assets, the less vulnerable one person is.

Source: Disaster risk reduction: a gender and livelihood perspective. InfoResources Focus No 2/09

For more information, see Working with Women and Men.

Afghanistan signed the UNFCCC in 1992, and ratified the Kyoto Protocol[6], valid until 2020, in 2013. The Paris Agreement (signed in April 2016) is the universal commitment that seeks to limit global warming to less than 2°C. Afghanistan has presented the following climate change related strategies and documents to the UNFCCC:

- **National Adaptation Programmes of Action for Climate Change** (NAPA) and National Capacity Needs Self-assessment for Global Environmental Management (NCSA) in 2009[7].
- **National Communication** submitted in 2012, and is currently preparing its Second National Communication (SNC) for submission to the UNFCCC in 2016[8].
- At present, Afghanistan is finalizing its national **Climate Change Strategy and Action Plan** (ACCSAP) as well as its National Adaptation Plan (NAP).
- For the negotiations in Paris, each country had to submit its national contribution, the '**Intended nationally determined contribution'** (INDC) which gives an overview of what Afghanistan aims to do in for mitigation but also highlights its adaptation needs.

The **National Environmental Protection Agency** (NEPA) is the leading Afghan national institution to coordinate with Climate Change conventions, development partners and government and private institutions.

Disaster Risk Management

[6] The protocol aiming at paving the way for emission reduction in industrialized countries (so called Annex I countries)
[7] Available at: http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/4585.php
[8] Available at: http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php

The **Sendai Framework for Disaster Risk Reduction** (2015-2030) was signed by 187 states, including Afghanistan, in March 2015 and replaces the former Hyogo Framework for Action (2005-2015) on disaster risk reduction.

In Afghanistan, the **Afghanistan National Disaster Management Authority** (ANDMA) is responsible for DRM and has provincial offices and coordinating mechanism through the National Disaster Management Commission as well as Provincial Disaster Management Committee at the sub-national levels.

Box 3: Key elements of the SFDRR

Outcome: The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

Goal: Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

Source: UNISDR, 2015: SFDRR chart

Author(s): Nicole Clot, April 2016

This publication has been made possible through financial support of Swiss Agency for Development and Cooperation SDC. The content, however, is the sole responsibility of HELVETAS Swiss Intercooperation.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Federal Department of Foreign Affairs FDFA
Swiss Agency for Development and Cooperation SDC

Further readings

- FAO, 2012: Planning for community-based adaptation to climate change (e-learning tool). Available at: http://www.media-suedwest.de/FAO/FAOnrcASIAtool2012en/fao-webgeo-2-intro/
- UNITAR, 2013: Resource guide for advanced learning on fundamentals of climate change science. Available at: http://www.uncclearn.org/sites/default/files/inventory/resource_guide_on_fundamentals_cc_science.pdf
- weADAPT: weADAPT, the collaborative platform on climate adaptation (website). Available at: https://www.weadapt.org/
- Humanitarian Policy Group, 2015: 10 things you should know about disaster risk reduction (movie). Available at: https://vimeo.com/142153857
- InfoResources, 2009: Disaster risk reduction: a gender and livelihood perspective. InfoResources Focus No 2/09. Available at: www.preventionweb.net/files/11436_focus092e1.pdf

Key reference documents for Afghanistan

- National Environmental Protection Agency, Afghanistan, 2009: Afghanistan. National capacity needs self-assessment for global environmental management (NCSA) and national adaptation programme of action for climate change (NAPA). Final joint report.
- Available at: http://unfccc.int/resource/docs/napa/afg01.pdf
- National Environmental Protection Agency, Afghanistan, 2013: Afghanistan. Afghanistan initial national communication to the United Nations Framework Convention on Climate Change. Available at: http://unfccc.int/resource/docs/natc/afgnc1.pdf
- Islamic Republic of Afghanistan, 2015: Report on the Intended Nationally Determined Contribution (INDC). Submission to the United Nations Framework Convention on Climate Change. Available at: http://www4.unfccc.int/submissions/INDC/Published%20Documents/Afghanistan/1/INDC_AFG_Paper_En_20150927_.docx%20FINAL.pdf