Module 3

Introduction to Climate Change Adaptation
Learning Objectives

1. Explain the importance of adaptation in preparing for and coping with climate change
2. Outline key elements of a vulnerability assessment
3. Identify adaptation options
4. Explain linkages between climate change adaptation and development planning

By the end of the module participants will be able to:
Section 1 starts out with a definition of *climate change adaptation* and related concepts. It further highlights the importance of adaptation by presenting climate change impacts on key sectors and global costs estimates. The section also presents key elements of an adaptation process, highlighting two critical parameters for effective adaptation, namely data availability and stakeholder engagement.
Climate change may be more rapid and pronounced than expected and will have wide-ranging impacts on ecological systems as well as various other aspects of our lives and human systems. Ecological, social and economic systems have to adjust to the changing climate and the expected effects or impacts thereof in order to minimize potential negative effects. This “adjustment” by both natural and human systems is commonly referred to as “adaptation”. While the impacts of climate change can impose serious threats to lives and livelihoods, particular in developing countries, climate change adaptation may also result in non-climate related co-benefits, such as fostering social-learning and more resilient societies.

Various approaches to climate change adaptation exist. Approaches can range from modifying threats (building a dam for flood control) to preventing effects and impacts (introducing drought resistant crops) to accepting the loss (when an adaptation measure is too costly). Generally the distinction is made between two groups of adaptation options: anticipatory or reactive adaptation. Examples of anticipatory adaptation include development of new building codes to better protect human settlements. Reactive adaptation examples include changes in farm practices such as additional irrigation measures in case of dry-spells.
The vulnerability of systems, including human, geophysical, biological and socio-economic systems to climate change differs substantially across regions and across populations within regions. Vulnerability to climate change deals with the extent to which climate change may damage or harm both natural and human systems. In addition to climate vulnerability, countries have different capacities to adapt to the impacts of climate change. Resilience is an indication of the ability of a system to absorb changes and is thus closely related to the concept of adaptive capacity. Climate risk refers to the probability of occurrence of the impacts of climate change, such as drought and flooding.

UNDP (2011). Improving access, understanding and application of climate data and information.
Climate change in the form of higher maximum temperatures, changing precipitation patterns, melting of snow and ice, sea level rise, changes in the frequency and intensity of extreme weather events, etc. will impact nearly all social and economic sectors. For example, it is likely that future typhoons and hurricanes will become more intense, with major impacts for spatial planning and disaster risk reduction. The global average surface air temperature is estimated to increase between 1.1°C and 6.4°C by 2100, with significant consequences for sectors such as agriculture, health, water, forestry, etc.

IPCC (2007). Fourth Assessment Report

For more detailed information about climate change science, including observed and projected trends and impacts see Module 1.
The following tables provide examples of how different levels of temperature rise would affect different sectors. Temperature change is, for example, impacting the water sector (decreased water availability in mid and low latitudes leading to increased water stress for hundreds of millions of people), as well as ecosystem conservation (loss of species).

Source: UNDP (2009). Gender and Climate Change, p17
Higher temperatures will also impact the food and agriculture sector (decreased cereal productivity in low latitudes, increased cereal productivity in high latitudes), coastal management (increased damage from floods and storms), as well as the health sector (increased mortality from heat waves, changing distribution of disease vectors like mosquitos).

Source: UNDP (2009). Gender and Climate Change, p17
Estimations vary, but there is a general agreement that adaptation needs in developing countries are in the order of billions USD per year. Donors have agreed at the 2009 Climate Change Conference in Copenhagen that 100 billion USD per year should be provided by 2020.

In addition to considering the costs of adaptation, it is also important to consider the costs of not taking any adaptation action, or a delayed response. While adaptation actions may often be costly, inaction or delayed action can cause serious and irreversible damages to both natural and human systems with ultimately even higher financial implications.
The first element of any adaptation initiative is the observation of climatic and non-climatic, socio-economic and environmental variables. These variables can then be used to assess climate impacts and related vulnerabilities. Based on this assessment adaptation options can be selected taking into account different factors such as cost-effectiveness, potential co-benefits and public acceptability. Once an adaptation activity or action is selected it needs to be implemented. Monitoring and evaluation of adaptation actions can help to provide feedback to ensure that adaptation activities are appropriate, effective and revised where necessary.

Availability of climate data and other data on the environment is vital in assessing potential climate change impacts and plan adaptation activities. Socio-economic data and scenarios are also important since they provide information about the vulnerability and adaptive capacity of a certain region or country. Information about relevant policies, plans and strategies at various levels is also essential to make sure adaptation activities are aligned with other planning processes.

While effective adaptation planning requires reliable and high quality data, this information is often difficult to access, especially in developing countries. However, many things can be done in the form of ‘no regrets’ activities; i.e. things that would make sense doing with or without the impact of climate change.


UNDP, UNEP, GEF. National Communications Support Programme: Applying Climate Information for Adaptation Decision-Making, p22

For more detailed information about climate data see Module 1.
Stakeholders play an essential role in designing and implementing adaptation activities. They can, for example, provide important information about local circumstances and thereby contribute to more effective planning. Effective stakeholder engagement is also likely to enhance the acceptance of decisions taken. Key stakeholders range from community members, policy-makers, researchers and experts to non-governmental organizations.
Small communities are likely to be the most severely affected by climate change impacts and yet are least equipped to cope and adapt. Community-based adaptation projects seek to enhance the resilience of communities, and/or the ecosystems on which they rely, to climate change impacts. This slide provides an example of a community-based adaptation project in Samoa supported by the UN Development Programme (UNDP).

UNDP Adaptation Learning Mechanism
Achim Steiner, Executive Director of the UN Environment Programme (UNEP) answers key questions such as: which regions will be most affected by climate change; what is the role of adaptive capacity in responding to climate change; and what measures are needed to finance adaptation in developing countries.
Section 2 presents main elements of climate change vulnerability assessments and explains the evolution of assessment methods over time. The section also provides a number of examples to illustrate the different components of vulnerability. A special emphasis is put on gender vulnerability.
Various components contribute to climate vulnerability. The exposure to climate-risk related factors, as well as the degree to which a system is affected by a climate stimuli ("sensitivity"), both contribute to the potential impacts that climate change will have on a system. For example, if climate change leads to heavy rainfalls in a certain region (exposure) and the crops traditionally planted in this region are not resistant to high amounts of precipitation (sensitivity), then this will lead to decreased crop productivity (potential impact). If, however, the adaptive capacity of the region is very high (farmers are able to switch to more resistant crop varieties) then vulnerability is reduced, despite high exposure and sensitivity. In sum, climate vulnerability is determined by the potential impacts of climate change and the capacity of natural and human systems to adapt thereto. Vulnerability can be identified at different levels or scale (regional, national, local) for different sectors (agriculture, water, health, etc.), and for different population groups (women, children, urban poor, landless rural laborers, etc.).

The 2014 IPCC report on Impacts, Adaptation and Vulnerability highlights the concept of risks. In this perspective, vulnerability constitutes one of the factors that shape the level of risk for a particular location and societal group. The other components of risk are exposure and hazards. Vulnerability and exposure are largely influenced by socio-economic processes. Hazards on the other hand are mainly driven by changes in the climate system.

**Climate risks** are therefore dynamic, varying across temporal and spatial scales, and depend on economic, social, geographic, demographic, cultural, institutional, governance, and environmental factors. Effective adaptation strategies consider these dynamics and the inter-linkages between socio-economic development pathways and the vulnerability and exposure of people.

Assessing the various components that contribute to climate change vulnerability is an important part of adaptation planning, and one of the first steps. Vulnerability assessments can assist in (1) determining the extent that climate change is likely to damage or harm a system and (2) adapting to the impacts of climate change. They provide hence a basis for identifying the most appropriate adaptation options. Vulnerability assessments are also important as they can provide evidence of the linkages between climate and development, improve understanding of specific risks and vulnerabilities in different localities, provide the opportunity for capacity building, and serve as a baseline analysis to monitor how risks may be influenced by a changing climate over time.
Assessments of climate change vulnerability vary widely, depending on the scope, time frame and geographic coverage of the assessment. Consequently, a wide range of methods and tools have been developed and applied. In all different approaches, socio-economic data and scenarios are important inputs, in addition to climatic information. A summary of existing and emerging approaches to vulnerability assessments, their associated methods and tools, has been developed by the UNFCCC (2011). All the approaches summarized respond to a growing need for policy-relevant information, greater integration of stakeholder inputs and robust treatment of uncertainties in the planning processes.

UNFCCC (2011), Assessing Climate Change Impacts and Vulnerability: Making Informed Adaptation Decisions

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>KEY FEATURES</th>
<th>MOTIVATION</th>
<th>GOALS</th>
<th>METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPACT-BASED</td>
<td>Research driven</td>
<td>Identify actions to reduce risks</td>
<td>• Biophysical and socio-economic impacts</td>
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<tr>
<td>VULNERABILITY-BASED</td>
<td>Research/Stakeholder driven</td>
<td>Identify actions to reduce vulnerability</td>
<td>• Vulnerability indicators</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Climate risks</td>
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<tr>
<td>ADAPTATION-BASED</td>
<td>Research/Stakeholder driven</td>
<td>Identify actions to improve adaptation</td>
<td>• Livelihood analysis</td>
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<tr>
<td>INTEGRATED ASSESSMENT</td>
<td>Research/Stakeholder driven</td>
<td>Identify global climate policy and economic options</td>
<td>• Narrative methods</td>
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<tr>
<td>RISK MANAGEMENT</td>
<td>Decision-making driven</td>
<td>Inform climate risk management decisions</td>
<td>• Cross-sectoral interactions</td>
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Source: Reproduced from UNFCCC 2011 p18
Assessment approaches evolved from first generation to second-generation studies.

First generation assessments focused more on what the impacts of climate change will be rather than adaptation itself. Impact assessments were driven by the goal to understand long-term consequences and followed a “scenario-based approach” that was often derived from Global Climate Models (GCMs). These climate scenarios were then applied to models of ecosystems or to a component of the bio-physical environment (sea level, coastal zones, mountains, etc.). The results of these assessments were further carried forward to the modeling of socio-economic impacts and only then was adaptation considered. Since the first generation studies, the methodology for vulnerability and adaptation assessments has gone through a significant evolution.

UNFCCC (2008). Compendium on Methods and Tools to Evaluate Impacts of, and Vulnerability and Adaptation to, Climate Change, p2
CGE Training Material: Vulnerability and Adaptation Assessment, Chapter II
The “second generation” of assessments focuses on the question on “how to adapt” rather than on modeling climate change impacts. The recent literature underscores that risks from climate change are not solely externally generated circumstances or changes in the climate system to which societies respond, but rather, the result of complex interactions among societies or communities, ecosystems, and hazards arising from climate change. The new approach integrates the concept of vulnerability while undertaking assessments and it also distinguishes between current and future vulnerabilities of key environmental and socio-economic variables. These types of assessments integrate socio-economic factors and data (household surveys, census data) more adequately with biophysical assessments and also tend to address shorter-term concerns.

CGE Training Material: Vulnerability and Adaptation Assessment, Chapter II
UNFCCC (2011), Assessing Climate Change Impacts and Vulnerability: Making Informed Adaptation Decisions
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CGE Training Material: Vulnerability and Adaptation Assessment, Chapter II
Droughts have increased in frequency and intensity in Eastern Africa, where frequent droughts have occurred in each decade over the past 50 years. The increased occurrence of prolonged dry periods affects in particular the climate-sensitive agriculture sector. Adaptive capacity in the region is low due to poverty, limited access to technologies, as well as poor policy and institutional frameworks. The combination of high potential impact and low adaptive capacity makes the region highly vulnerable to climate change and climate variability. The slide provides an example of changing rainfall patterns in Kitui county, Kenya.

IPCC website

Exposure to climate-related risks and sensitivity to changing climate conditions in Kitui is high, while adaptive capacity is low. Vulnerability to climate change and climate variability is hence high.

Global mean sea level is projected to rise between 0.09 and 0.88 m above the 1990 level by 2100. This rise is due primarily to thermal expansion of the warmer oceans combined with melting of glaciers and ice sheets. Rising sea levels are expected to have severe effects on many low-lying areas. Some countries are particularly vulnerable to sea-level rise, such as small-island developing states (SIDS). Others have higher capacity to adapt, such as the Netherlands.

WMO website
Exposure to climate-related risks and sensitivity to changing climate conditions in the Netherlands is high. However, adaptive capacity is also high. Therefore, vulnerability to climate change is rather low.
Over the past several decades the sea surface temperatures over most tropical ocean basins have increased in magnitude by between 0.25 – 0.5 degrees Celsius. Some researchers argue that ocean warming has caused a substantial increase in the probability and intensity of tropical cyclones, even though no consensus has been reached on this issue. It is likely that tropical cyclone intensity will further increase if the climate continues to warm and countries such as Jamaica are taking measures to prevent potential damage.

WMO International Workshop on Tropical Cyclones (November 2006). Statement on Tropical Cyclones and Climate Change
Exposure to climate-related risks in Jamaica is high, while sensitivity and adaptive capacity is medium. Therefore, vulnerability to climate change can be rated as rather medium.
The table summarizes some of the good practices and lessons learned under the Nairobi work programme on climate risk and vulnerability assessments.

UNFCCC (2011), Assessing Climate Change Impacts and Vulnerability: Making Informed Adaptation Decisions
While the impacts of climate change affect everyone, they also reinforce existing inequalities. Factors that determine and influence these differential vulnerabilities to climate-related hazards include: ethnicity, socioeconomic class, gender, age, as well as migration experience and homelessness. Vulnerability in terms of gender is not determined through biology, but by social structures, institutions and rule systems; hence women and girls are often (not always) more vulnerable due to the fact that they are marginalized from decision making, experience discrimination in development and reconstruction efforts, or are working in sectors that are particularly vulnerable to climate change. In the agricultural sector, for example, rural women in developing countries are the primary producers of staple food, a sector that is highly exposed to climate risks such as drought and uncertain rainfall. In many countries, climate change means that women and young girls have to walk further to collect water, especially in the dry season. Already today, women in sub-Saharan Africa spend 40 billion hours per year collecting water. Moreover, women will contribute much of the unpaid labor that will go into coping with climate risks through, for example, soil and water conservation, or the building of anti-flood embankments. Therefore it is important that gender considerations are taken into account in both medium- and long-term adaptation.

UNDP (2009). Gender and Climate Change, p III

Further information:

Inefficient representation of women in the international climate change decision-making processes also further contributes to inequalities. The 18th Conference of the Parties (COP 18) to the UN Framework Convention on Climate Change (UNFCCC) (Doha, 2012) therefore adopted a decision to promote gender balance and to improve the participation of women during UNFCCC negotiations as well as the representation of women in bodies established under the UNFCCC and the Kyoto Protocol.
Section 3 first presents the range of adaptation options that are available and then discusses different methods and criteria for selecting the most adequate option. The section also provides a sectoral perspective highlighting possible adaptation measures in a number of key sectors.
After conducting a vulnerability assessment it is important to identify possible adaptation options. A variety of options are available, ranging from traditional development activities to more specific adaptation measures. At one end of the continuum a focus is placed on vulnerability. Here adaptation efforts are vulnerability-oriented and there is an overlap with traditional development support. At the other end, activities target climate change impacts and are more ‘impact focused’. These adaptation activities fall outside the scope of traditional development aid. Funding for activities on the left usually needs to be sought from traditional development funding sources while activities on the right can more easily benefit from new adaptation funding measures. Vulnerability-focused activities often represent the foundation of climate change adaptation.

World Resources Institute (2009). A Continuum of Adaptation Activities: From Development to Climate Change


Further information:

The above diagram and explanation gives a clear indication that adaptation is not something that can be seen separate from development. Many adaptation options are linked to sustainable development practices such as maintaining ecosystems, integrated water resource management, and disaster risk reduction.
This table provides examples of the different foci of adaptation actions (from reducing vulnerability to addressing climate change impacts) explained in the previous slide.

Given the range of possible adaptation actions, different options need to be evaluated and compared to ensure that the best option is selected. This table identifies some of the most commonly used methods to evaluate adaptation options, including cost-benefit, cost-effectiveness, and multi-criteria analysis.

UNFCCC (2011). Highlights of the Contribution of the Nairobi Work Programme, p31

Further information:

A proper analysis of different adaptation options is also important to avoid the duplication of activities and prevent “maladaptation”. An example of maladaptation could be an agricultural project that supports monoculture of a high-value crop, with the objective of maximizing irrigation system efficiency, water productivity and yields (“more crop per drop”), and, ultimately, boosting income generation. Although such a project might be designed taking into account the effects of climate change, it would lower the adaptive capacity of farmers by making their income generation base more volatile. In the case of a bad harvest, farmers’ income would be greatly affected, i.e., the ultimate impact of the project would be one of increased vulnerability to climate risks.

As mentioned in the previous slide, multi-criteria analysis looks at a range of factors that could influence the selection of an adaptation option. This table provides an overview of possible criteria to be considered. The criteria should be customized depending on national/local circumstances. For example, other criteria could be added such as ‘political leadership’ and ‘political context’. It is also important to bear in mind that, rather than identifying one best option, the goal is to develop a ‘portfolio’ of options that can be implemented in shorter and longer time scales.

IISD, UNITAR, UNEP (2009). IEA Training Material - Vulnerability and Climate Change Impact Assessment for Adaptation, p37
In this graph, findings from two recent studies on adaptation to flood risk in Guyana and Mozambique illustrate the relationship between the economic cost-benefit ratio and the robustness of measures to climate change uncertainties, two of the various important factors in selecting an adaptation option. Both Guyana and Mozambique have experienced damages from flooding and in accordance with climate models it is predicted that climate change could alter flood risk in the future. ‘Hard adaptation options’, such as drainage systems were the focus of the Guyana study whereas ‘soft adaptation options’ such as reducing social vulnerability were explored in the Mozambique study.


Further information:

On the vertical axis, the blue bubbles indicate the relative costs and benefits of flood management options for Guyana and the green bubbles apply to Mozambique. (The grey bubbles are illustrative and are drawn from other case studies). Measures at the bottom of the figure have the highest benefits relative to costs, while measures at the top have the lowest benefits relative to costs. For example, in Guyana, improved building codes would have greater damage reduction benefits relative to costs, than upgrading the drainage system.

Another important factor to take into consideration is the robustness of adaptation measures. ‘Robustness’ measures how effective a measure could be for a diverse range of plausible future scenarios. The level of robustness is shown on the horizontal axis and can be thought of as the risk of mal-adaptation. On the left-hand side of the figure are ‘no-regrets’ options (i.e. high robustness), such as early warning systems, improved education, and health care, which have strong benefits in any climate. ‘Higher-regret’ options (i.e. low robustness) are shown on the right-hand side and include drainage systems and flood defenses, where the choice of measure (and the resulting benefits) is more dependent on assumptions today about the future climate.
Climate change has already significantly impacted agriculture and is expected to further impact directly and indirectly food production. Increase of mean temperature, changes in rain patterns, increased variability both in temperature and rain patterns, changes in water availability, the frequency and intensity of ‘extreme events’, sea level rise and salinization, perturbations in ecosystems, all will have profound impacts on agriculture, forestry and fisheries. The slide illustrates some examples of possible adaptation measures.

FAO (2013). Climate-Smart Agriculture Sourcebook

Further information:

Agriculture has to address simultaneously three intertwined challenges: ensuring food security through increased productivity and income, adapting to climate change and contributing to climate change mitigation. To address these three intertwined challenges, food systems have to become, at the same time, more efficient and resilient, at every scale from the farm to the global level. In this context, FAO has forged the concept of “climate-smart agriculture” as a way forward for food security in a changing climate.
This learning package, produced by the Food and Agriculture Organisation (FAO) of the UN, explores the impacts of climate change on agriculture, as well as possible technical and policy considerations that can help building food security under current and future challenges. The technical and policy considerations explored are meant to contribute towards climate-resilient and environmentally sound or "climate-smart" agriculture — agriculture that increases productivity; enhances resilience to global change; stops ecosystem services deterioration; and produces economic and social benefits. The package was developed in the context of a climate change adaptation project in the Yellow River Basin in China.
The Overseas Development Institute (ODI) undertook an analysis of planned interventions in the water sector outlined in the National Adaptation Programmes of Actions (NAPAs) of Least Developed Countries (LDCs). Almost all of the interventions outlined in the NAPAs aim to address inter-annual variability (such as Bhutan, Burundi) or extreme weather events (Kiribati). There are only a few interventions that aim to address long-term climate change (including Bangladesh and Maldives). Very few interventions attempt to address issues of social and political access. Water supply and irrigation projects in Cambodia and Eritrea aim to establish water user communities. Others, like those in Guinea Bissau, São Tomé and Príncipe and Lesotho co-relate improved access to investments in physical infrastructure. Low-tech solutions such as water quality testing, filtration, school gardens and rainwater catchment systems, to name a few, are just as important to keep in mind when considering adaptation interventions.

ODI (2009). Adapting to Climate Change in the Water Sector: ODI Background Note
Climate change has multiple influences on human health. Direct impacts include the effects of rising temperatures and more intense heat waves and floods. However, potentially larger impacts may arise from indirect mechanisms. Warmer temperatures and a more variable climate can impact agricultural production and food availability, the availability of clean water and sanitation, and the transmission of vector and water-borne diseases. The World Health Organization (WHO) estimates that climate change may already be causing over 150,000 deaths per year and these risks are expected to increase substantially in the future. The slide presents possible adaptation measures to reduce health risks.

WHO (2009). Protecting Health from Climate Change
WHO website
The video produced by the Regional Office for Europe of the World Health Organisation presents an initiative to pilot health adaptation across seven countries (Albania, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, Macedonia and Uzbekistan). Each country is responding with a variety of adaptation actions - from safe water and sanitation to extreme weather events risk management.
On any given day, more than a billion children go to school. General education is the most common means by which societies prepare their youth for the future, including a changing climate. Therefore, many countries have embarked on integrating climate change in school curricula, developing relevant learning materials, and providing training for teachers. At the same time the education sector is also vulnerable to the impacts of climate change and facilities such as schools need to be prepared to extreme weather events (e.g. storms) which might become more intense in the future due to climate change.

Section 4 provides a short introduction to linkages between climate change adaptation and development. It further discusses opportunities for integrating adaptation within development planning, and highlights implementation challenges.

More detailed information on climate change adaptation planning processes is provided in Module 6 “Introduction to Climate Change Governance and Planning”.
The issue of climate change can seem remote compared with immediate problems such as poverty, disease and economic stagnation. Yet, the ability to successfully address these core development priorities risks being seriously undermined by climate change.

Climate change is a development challenge which had direct implications for the achievement of several of the Millennium Development Goals (MDGs). It is now a self-standing goal in the Sustainable Development Goals (SDGs).

The negative impacts of climate change will disproportionately hit poor people and poor countries and exacerbate inequalities. Climate change brings greater water stress and scarcity and poses a real threat to food security in many countries in Africa, Asia and Latin America. For example, higher temperatures in Asia, cause lower rice yields. Other impacts of climate change include heat-related mortality, spread of vector-borne diseases like malaria, and access to natural resources. The following tables illustrate a non-exhaustive list of possible impacts of climate change on selected Sustainable Development Goals (SDGs) for least developed countries.

IIED (2015). Briefing. Impact of climate change on Least Developed Countries: are the SDGs possible?
## Potential Impact of Climate Change on the Sustainable Development Goals (II)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Potential Impact of Climate Change on Achievement of Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure healthy lives and well-being</td>
<td>* Direct effects of climate change include increases in heat-related mortality and illnesses associated with heat waves.  &lt;br&gt; * Climate change may increase the prevalence of some vector-borne diseases (for example malaria and dengue fever), and vulnerability to water, food, or contagious diseases (for example cholera and dysentery).</td>
</tr>
<tr>
<td>Resilient cities and human settlements</td>
<td>* In a rapidly urbanizing world, climate change-related risks to urban settlements are higher. Extreme events damage housing and affect especially vulnerable informal settlement.</td>
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</tbody>
</table>

Source: Adapted from IED: Briefing, May 2015
The previous slides have illustrated the close relationship between climate change adaptation and development. While in certain situations stand-alone adaptation measures can be effective, in most other cases, adaptation measures need to be implemented as part of a broader suite of measures within existing development processes and decision cycles. This is known as “mainstreaming”.

For example, adaptation responses to the risks posed by climate change on agriculture might need to be incorporated as part of existing farming practices, within irrigation and community development plans and projects, as part of sectoral policies in agriculture, and within donor countries’ assistance strategies as well as within national development and poverty alleviation strategies.

OECD (2009). Integrating Climate Change Adaptation into Development Cooperation

Various ways to integrate adaptation in development planning exist and it is important to find the right entry points. Key processes include long-term (15–20 years) visions and national development strategies as well as shorter-term (3–5 year) national policies and poverty reduction strategies. Such documents have a high potential to foster adaptation at various levels since they set the stage for national plans and legislation, sector and subnational plans and policy measures. In addition to including adaptation considerations in strategies and policies, it is important to make sure that budgets and investment programmes provide adequate finance for implementation.

OECD (2009). Integrating Climate Change Adaptation into Development Cooperation

More detailed information is provided in Module 6 “Introduction to Climate Change Governance and Planning”.
An important planning element is to link adaptation efforts with disaster risk reduction (DRR) strategies. While DRR covers non-climate related disasters such as earthquakes, it also addresses climate-related disasters such as floods, droughts, cyclones and storm surges - all risks that are associated with climate change. It is therefore important, for example, to integrate the findings of climate change risk assessments into the planning process for disaster risk reduction. In this manner enhancing existing DRR plans and systems (e.g. early warning systems and emergency plans) will also be relevant to climate change.

Oxfam (2009). Introduction to Climate Change Adaptation
To successfully operationalize adaptation mainstreaming the following measures are relevant:

- Accompanying adaptation policy measures with suitable budgetary allocations. This entails leveraging domestic and external funding sources.
- Moving overall coordination functions into a central body with convening/decision-making power vis-à-vis line Ministries (e.g. office of the President, Planning Ministry, etc.).
- Strengthening coordination through inter-sector mechanisms (existing or newly established).
- Collaborating with national, sector and subnational bodies to build their capacities to implement policy measures for adaptation. The implementation of adaptation measures at various levels can thereby benefit from the involvement of non-governmental actors.
- Integrating adaptation indicators in the national monitoring system to track emerging trends related to climate change as well as the implementation and impact of policies.

Section 5 provides an overview of international initiatives to support climate change adaptation.
This slide provides a brief overview of the adaptation work streams under the UN Framework Convention on Climate Change (UNFCCC). They will be discussed in more detail in the following slides.
The Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change (NWP) was developed with the aim to assist all Parties in particular developing countries to improve their understanding of climate change impacts and vulnerability and to increase their ability to make informed decisions on how to successfully adapt to climate change. By providing information on the range of available adaptation options the NWP assists Parties to plan for adaptation. The first phase of the work programme was implemented during 2005 until mid 2008. The Second phase commenced mid 2008 until 2010. During 2010 parties to the UNFCCC decided to continue working under the NWP. COP 21 launches the Adaptation Knowledge Portal under the NWP.
NAPAs provide an opportunity for LDCs to identify their urgent and immediate adaptation needs and to prioritize adaptation activities accordingly. This is to reduce climate change vulnerability, to strengthen capacity and to address adaptation needs for which delay will cause increased vulnerability or cost at a later stage. NAPAs are compiled at country-level and are flexible, action-orientated and based on national circumstances. NAPAs can also serve as a basis for national climate change policies and strategies. Once a NAPA is submitted to the UNFCCC a LDC is eligible for funding under the LDC Fund for its implementation. As of July 2013 USD 774.9 million had been pledged to the LDCF. The newly established Green Climate Fund will also provide support towards NAPAs. As of 2015, 50 countries have prepared and submitted their NAPAs.

UNFCCC website
GEF website
The National Adaptation Plan (NAP) process enables Parties to assess climate risks and vulnerabilities and plan adaptation actions. Support, by means of technical guidelines, papers, advice, training workshops, synthesis reports and knowledge sharing is provided to least developed countries to assist with formulating NAPs.

UNFCCC website
This slide compares the NAPA and the NAP processes. The NAPs can be seen as an evolution of the NAPAs, moving from a focus on urgent/immediate adaptation needs to a longer term perspective. While most NAPAs were developed under the lead of Environment Ministries, the NAP process engages Planning, Finance and sectoral Ministries to promote integration of climate change adaptation into development planning. While the NAPAs targeted Least Developed Countries (LDCs) only, the NAP process covers all interested developing countries.

Draft NAP Global Support Programme (GSP) (2012) - Submission to the GEF
Existing mitigation commitments and actions are not enough to prevent dangerous climate change related impacts. Therefore, developing countries are calling for international commitment to act on loss and damage. In this context, the Work Programme on Loss and Damage was established in 2010 as part of the Cancun Adaptation Framework. It considers approaches to address loss and damage associated with the impacts of climate change in developing countries that are particularly vulnerable to the adverse effects of climate change. Activities under this work programme are undertaken in three thematic areas. Thematic Area I assesses the risk of loss and damage that are associated with adverse effects of climate change. Thematic Area II looks at the various approaches to address such loss and damage. In addition to loss and damage associated with the adverse effects of climate change it also includes impacts that relate to extreme weather events and slow onset events. The third thematic area addresses the role of the UNFCCC in strengthening the implementation of approaches to address loss and damage.

UNU, CDKN & ACPC (2013). Fact Sheet - Pushing the Limits: Pioneering Study Shows Evidence of Loss & Damage in Vulnerable Communities
Existing mitigation commitments and actions are not enough to prevent dangerous climate change related impacts. Therefore, developing countries are calling for international commitment to act on loss and damage. As part of the Cancun Adaptation Framework, the Warsaw Mechanism for Loss and Damage is the body under the Convention which aims to strengthen knowledge, international cooperation and implementation of approaches to reduce loss and damage associated with the adverse effects of climate change in especially vulnerable developing countries.

Activities under the L&D mechanism focus on better knowledge of risk management approaches, stronger dialogue and synergies among stakeholders and enabled action and support through finance, technology and capacity-building.

UNFCCC website
UNU, CDKN & ACPC (2013). Fact Sheet - Pushing the Limits: Pioneering Study Shows Evidence of Loss & Damage in Vulnerable Communities
The video is part of a series of 15 interviews with participants of the conference “Perspectives on Loss and Damage: Society, Climate Change, and Decision Making”, hosted by the United Nations University Institute for Environment and Human Security (UNU-EHS) at the UN Campus in Bonn, Germany from 25 to 27 February 2013.
During the 2010 Climate Change Conference (COP 16), held in Cancun Mexico, Parties affirmed that adaptation should get the same priority as mitigation. In this context, Parties adopted the Cancun Adaptation Framework (CAF) as part of the Cancun Agreements.

and additional long-term, scaled-up, predictable, new
Annex

Additional Resources
Module Summary

- Adaptation is any action taken to reduce the impacts or even benefit from the effects of climate change.
- Assessing the vulnerability of a locality is the first step to plan and undertake adaptation action. Components of vulnerability include exposure, sensitivity and adaptative capacity.
- Adaptation actions need to be designed to suit the circumstances and needs of different sectors and countries/regions.
- There is a strong link between adaptation and development planning. Integrating adaptation and development planning can bring additional benefits beyond reduced vulnerability to climate change.
Useful Links

CDKN

CGIAR Research Programme

Africa Adaptation Knowledge Network

World Bank Climate Risk and Adaptation Country Profiles

UNISDR National Platforms for Disaster Risk Reduction

FAO e-Tool Community-Based Adaptation

IFAD e-Learning on Smallholder Agriculture and Climate Change

NAPAs Received by the UNFCCC Secretariat

UN CC:Learn

PreventionWeb
Recommended Readings

- OECD (2009): *Guidance on Integrating Climate Change Adaptation into Development Co-operation*
- PROVIA (2012). *Guidance on Assessing Vulnerability, Impacts and Adaptation (VIA)*
- UNDP (2010). *Designing Climate Change Adaptation Initiatives: A UNDP Toolkit for Practitioners*
- UNDP (2012). *Africa Adaptation Programme: Handbook on Capitalisation of Experiences*
- USAID (2012). *Climate Change Adaptation Manual*
Main References

- OECD (2009): *Guidance on Integrating Climate Change Adaptation into Development Co-operation*
- IIID, UNITAR & UNEP (2009): *IEA Training Material: Vulnerability and Climate Change Impact Assessment for Adaptation*
- UNFCCC (2008): *Compendium on Methods and Tools to Evaluate Impacts of, and Vulnerability and Adaptation to, Climate Change*
- UNFCCC: *CGE Training Materials: Vulnerability and Adaptation Assessment, Chapter Two*
- UNFCCC: *Official Website*