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Lecture Notes of the Massive Open Online Course

National Adaptation Plans: Building Climate Resilience in Agriculture

Module 1: Introduction to climate change adaptation, agriculture and food security

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Food and Agriculture Organization of the United Nations

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Module 1

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Foreword

This document presents a lecture note prepared for the National Adaptation Plans: Building Climate Resilience into Agriculture Massive Open Online Course (MOOC) which is one of the deliverables of the National Adaptation Plans (NAP-Ag) Programme.

The NAP-Ag Programme is a joint effort led by the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) to support a set of developing countries to identify and integrate climate change adaptation measures in the agricultural sectors into relevant national planning and budgeting processes. Under this programme, UNITAR supported UNDP and FAO in developing a MOOC to raise awareness and increase the capacities of a wide range of interested stakeholders in climate change adaptation planning, specifically for the agriculture sectors.

This MOOC is structured around 6 thematic modules:

1. Introduction to climate change adaptation, agriculture and food security
2. International Frameworks and National Adaptation Planning
3. Identifying and assessing climate change impacts and risks
4. Identifying and prioritizing climate adaptation options
5. Governance, coordination and finance
6. Communications, monitoring and evaluation

The lecture notes include links to complementary lecture videos and additional resources.

The Module 1 highlights the interlinkages between climate change and agriculture and the importance of adaptation planning for ensuring food security and sustainable development. This Module sets the scene for the course by introducing key concepts and terminology. It features case studies and examples that highlight differentiated impacts of climate change impacts on gender in agriculture and on migration. The Module 1 also presents key international developments such as the Paris Agreement, including the Nationally Determined Contributions, the 2030 Agenda and the Sendai framework, National Adaptation Plans and how they relate.

Learning Objectives

- (1) Identify interlinkages between climate change, agriculture and food security and the role of national adaptation planning;
- (2) Recognize differentiated climate change impacts on livelihoods and gender in agriculture;
- (3) Discuss the NAP's relation to the implementation of the 2030 Agenda, the Paris Agreement, and the Sendai Framework.

Acknowledgements

This course and the programme were made possible by the generous funding of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through its International Climate Initiative (IKI).

Part I

1.1. Impacts of climate change on agriculture, livelihoods and women, and vulnerabilities in agriculture sectors¹

Experts: Julia Wolf and Armine Avagyan

Key messages

- 1) Climate change is a significant “hunger-risk multiplier” and a fundamental threat to global food security. It affects all four dimensions of food security: availability, access, stability, and utilization of food.
- 2) With climate change, the population living in poverty could increase by between 35 and 122 million by 2030 compared to a future without climate change, largely due to negative effects on household incomes from agricultural.
- 3) The world’s poorest people and countries are particularly hard hit, the vast majority being smallholder producers in developing countries such as farmers, herders, fishers, forest-dependent communities as well as women and indigenous people.
- 4) Different impacts in high- and low-latitude regions indicate that climate change is likely to exacerbate existing imbalances between the developed and developing world.
- 5) Without adaptation to climate change in agriculture sectors, it will not be possible to achieve food security for all and eradicate hunger, malnutrition and poverty.

Agriculture is the main source of livelihood in most developing countries. Globally, 40 percent of the economically active population (about 1.3 billion people) was engaged in crop and livestock production in 2010. Based on 2011 estimates in many developing countries this proportion was much higher, e.g. 68 percent in Solomon Islands, 93 percent in Bhutan, and 89 percent in Burundi.² Additionally, fisheries and aquaculture, and forestry remain important sources of food, nutrition, income and livelihood for hundreds of millions of people around the world.³

Climate change is a fundamental threat to global food security and a significant “hunger-risk multiplier”.⁴

In many regions, food security is already being adversely affected by the climate change impacts such as rising temperatures, increased temperature variability, changes in levels and frequency of

¹ The contribution is largely based on “The State of Agriculture and food security: Climate change, agriculture and food security” publication which was prepared by FAO’s multiple authors. Executive summary available at <http://www.fao.org/3/a-i6132e.pdf>

² FAO, 2012a

³ FAO, 2012b; FAO, 2016c

⁴ Porter et al., 2014, FAO, 2016

precipitation, a greater frequency of dry spells and droughts, increasing intensity of extreme weather events, rising sea levels, and salinization of arable land and freshwater, pest and disease outbreaks. The world's poorest people and countries are particularly hard hit, the vast majority of who are smallholder producers in developing countries such as farmers, herders, fishers, forest-dependent communities as well as women and indigenous people.⁵

As climate change has **gender-differentiated impacts**, it intensifies the constraints that are already placed on women who make up around 43 percent of the agricultural labor force in developing countries and are already disadvantaged.

Overall, climate change affects all four dimensions of food security: availability, access, stability, and utilization of food.

Food availability will be further compromised by projected yield declines across all agricultural sectors⁶ such as the crop, livestock and fisheries and aquaculture, especially in sub-Saharan Africa and South Asia, where most of today's food insecure live. It is also important to note that already almost 815 million people are hungry today⁷, and food production will need to increase by 50–70 percent by 2050 to meet the needs of the expanding global population.⁸

Climate change will also very likely change the geography of production. For instance, in many cases, production is projected to shift from low latitude areas to high latitudes areas. Contrasted impacts between high- and low-latitude regions indicate that climate change is likely to exacerbate existing imbalances between the developed and developing world.⁹

Impacts on production directly translate into social and economic impacts through a range of different pathways that can result in changes in agricultural incomes and prices and also affect trade patterns and investment trends.¹⁰

Climate change also compromises **food access** by affecting the purchasing power of consumers, especially of the poor. Regarding food prices, most model projections indicate some price increases as a result of climate change, although the magnitude and locations vary considerably across models and climate change scenarios.

Climate change affects **food utilization** primarily through its impacts on food safety and health. In general, climate change is likely to reduce food safety through a higher incidence of food-borne diseases. Climate also affects health via multiple pathways, including geographical shifts in vector-borne diseases, heat stress and natural disasters.

⁵ FAO, 2014

⁶ In this lecture agriculture follows broad FAO definitions, and refers to crop-based farming systems, livestock systems (including rangelands and pasturelands), forestry, fisheries and aquaculture and related resource issues; including water, land, soils, genetic resources and biodiversity.

⁷ FAO et al, 2017

⁸ Alexandratos and Bruinsma, 2012

⁹ UNFCCC, 2012; Porter et al., 2014; FAO, 2016a

¹⁰ FAO, 2016a

With regards to **food stability**, the risks to food and nutrition security are exacerbated by the expected increase in the frequency and intensity of climate-related events. Shocks and crises caused by extreme weather events destroy resources and infrastructures and hence reduce overall food production capacity. Another potential impact of climate change lies in increased food price volatility.

According to FAO estimates already from 2003-13, the agricultural sectors absorbed nearly 23 percent of all loss and damage caused by climate-related disasters in developing countries. This has a devastating impact on the almost 80 percent of the world's poor who live in rural areas and earn income from agriculture for their livelihood. It is estimated that with climate change, the population living in poverty could increase by between 35 and 122 million by 2030 relative to a future without climate change, largely due to its negative impacts on incomes in the agricultural sector.¹¹

The effects of climate change on agricultural production and livelihoods are expected to intensify over time, and to vary across countries and regions. Selected potential impacts of climate change on different agricultural practices are presented in the Table 1. It is important to note that the agriculture sectors are extremely diverse not only in the way they will be impacted by climate change but also in how they will adapt to these changes.

Overall, negative effects of climate change will exacerbate poverty, increase food insecurity, affect the nutrition, lead to the loss of employment, and ignite conflicts and violence among and within rural communities, thus causing migration and forced displacement.

Thus, without adaptation to climate change in agriculture sectors, it will not be possible to achieve food security for all and eradicate hunger, malnutrition and poverty. It would be also not possible and achieve the Sustainable Development Goals of the 2030 Agenda and implement the Paris Agreement. Medium to long term planning is essential for the agricultural sectors to make the transformative changes necessary to adapt to climate change.

Furthermore, severe measures are taken, and countries reduce the greenhouse gas emissions and increase the removal of these gases from the atmosphere, it will be increasingly difficult and expensive to adapt to climate change.

¹¹ FAO, 2016a

Table 1: Selected potential impacts of climate change (Source, IPCC 2007, Pastor 2014; and FAO 2016a; 2016c)

	Crops and livestock	Fisheries and aquaculture	Forestry
LATIN AMERICA AND THE CARIBBEAN	<ul style="list-style-type: none"> • In temperate areas, soybean, wheat and pasture productivity increases • Drier soils and heat stress reduce productivity in tropical and subtropical regions • Increased salinization and desertification in arid zones of Chile and Brazil • Rainfed agriculture in semi-arid zones faces higher crop losses 	<ul style="list-style-type: none"> • Primary production in the tropical Pacific declines and some species move southwards • More frequent storms, hurricanes and cyclones harm Caribbean aquaculture and fishing • Changes in freshwater fish species physiology, collapse of coral reef systems 	<ul style="list-style-type: none"> • Tropical forests are affected more by changes in the water availability and CO₂ fertilization than by temperature changes • In Amazonia, increased risk of frequent fires, forest loss and “savannization” • In Central America, 40 percent of mangrove species are threatened with extinction
EUROPE	<ul style="list-style-type: none"> • Temperate and polar regions benefit from changes • Initial benefits in mid-latitude countries turn negative with higher temperatures • Climate-induced variability in wheat production increases in Southern and Central Europe • High temperatures and humidity increase livestock mortality risk 	<ul style="list-style-type: none"> • Warming displaces some fish populations northwards or to deeper waters • Invasive tropical species alter coastal ecosystems in southern Europe’s semi-enclosed seas • Aquaculture impacted by sea-level rise, acidification, temperature increases 	<ul style="list-style-type: none"> • In Northern and Atlantic Europe, higher temperatures and atmospheric CO₂ levels increase forest growth and wood production • Shrubs increasingly replace trees in Southern Europe • An increase in wildfires leads to a significant increase in greenhouse gas emissions
SUB-SAHARAN AFRICA	<ul style="list-style-type: none"> • Overall impacts on yields of cereals, especially maize, is negative across the region • The frequency of extremely dry and wet years increases • Much of southern Africa is drier, but rainfall increases in East and West Africa • Rangeland degradation and drought in the Sahel reduce forage productivity 	<ul style="list-style-type: none"> • Sea-level rise threatens coastlands, especially in West Africa • By 2050, declining fisheries production in West Africa reduces employment in the sector by 50 percent • East African fisheries and aquaculture are hit by warming, oxygen deficit, acidification, pathogens • Changes along coasts and deltas (e.g. death of coral reefs) impact productivity 	<ul style="list-style-type: none"> • Deforestation, degradation and forest fires affect forests in general • Forest losses reduce wildlife, bush meat and other non-wood forest production • Water scarcity affects forest growth more than higher temperatures

NORTH AFRICA AND NEAR EAST	<ul style="list-style-type: none"> • Rising temperatures threaten wheat production in North Africa and maize yields region-wide • There is a general decline in water availability, but a slight increase in Sudan, Somalia and southern Egypt • In mid-latitudes, higher temperatures lead to richer pastures and increased livestock production • Warmer winters benefit livestock, but summer heat stress has negative impacts 	<ul style="list-style-type: none"> • Usable water resources in many Mediterranean and Near East basins decline further • Warming boosts productivity in the Arabian Sea • Catch potential falls by as much as 50 percent in some parts of the Mediterranean and Red Seas 	<ul style="list-style-type: none"> • Deforestation, degradation and forest fires affect forests in general • Forest losses reduce wildlife, bush meat and other non-wood forest production • Water scarcity affects forest growth more than higher temperatures
ASIA	<ul style="list-style-type: none"> • Agricultural zones shift northwards as freshwater availability declines in South, East and Southeast Asia • Higher temperatures during critical growth stages cause a decline in rice yields over a large portion of the continent • Demand for irrigation water increases substantially arid and semi-arid areas • Heat stress limits the expansion of livestock numbers 	<ul style="list-style-type: none"> • Coastal flooding seriously affects capture fisheries and aquaculture in large river deltas • A general decline in coastal fisheries production and greater risk of extreme events in the aquatic systems • Redistribution of marine capture fisheries, with numbers declining in the tropics • Freshwater aquaculture faces major risks of freshwater scarcity • By 2050, the body weight of marine fish falls by up to 24 percent 	<ul style="list-style-type: none"> • Boreal forests and Tibetan plateau alpine vegetation shift northwards • Many forest species face extinction owing to combined effects of climate change and habitat fragmentation • A general increase in the frequency and extent of forest fires and the risk of invasive species, pests and diseases

Key definitions

Food security: "food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" World Food Summit 1996

Climate change adaptation: Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.

Vulnerability: is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.

Risk: is defined by the Intergovernmental Panel on Climate Change as "the *probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur*". It results from the

interaction between the hazard (weather event), exposure (system that can be affected) and the vulnerability.

Gender differentiated vulnerability to climate change impacts: Gender is one of many components of vulnerability to climatic change. Changes in the climate affect genders differently, magnifying existing gender inequality.

Resources for further learning

Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, pp. 485-533.

FAO, 2016. The State of Agriculture and Food Security: Climate change, agriculture and food security. Available at <http://www.fao.org/3/a-i6030e.pdf>

FAO, 2016. The future of food and agriculture. Trends and challenges. Trend 4 Climate change pp 39-45. Available at <http://www.fao.org/3/a-i6583e.pdf>

IPCC, 2014. Available at https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap7_FINAL.pdf

Video: We only have one Earth. Now is the time to take action. French Astroanaut, Thomas Pesquet, spent 196 days in the space. Seeing the Earth from the space changed his perception on climate change and food security issues. <http://bit.ly/2z3nWwR>

1.1 (a) Differentiated impact of climate change on gender in agriculture

Experts: Catherine Hill, Sibyl Nelson

Key messages

- 1) Climate change impacts are not experienced in the same way by men and women, boys and girls.
 - 2) The gender gap in agriculture shapes men's and women's vulnerability to climate and capacity to adapt to its effects.
 - 3) Addressing the gender gap in agriculture when planning for climate change is likely to lead to better outcomes.
-

Women's and men's adaptive capacity determines their vulnerability to climate change. Climate change exacerbates structural disadvantages, inequities for women and men in different ways which also depend on other factors (e.g. age, ethnicity, poverty, people living with disability, geography, etc.) Often the poorer or more marginalized groups in society have fewer resources to prepare for a disaster, to adapt to climate change, and to respond effectively when there is a shock to their household/community.¹²

The gender gap in agriculture shapes men's and women's vulnerability to and capacity to adapt to climate change. Women farmers are more exposed to climate risks compared with men for many of the same reasons that farm productivity is lower for female farmers than males – namely, women have fewer endowments and entitlements, they have less access to information and services, and they are less mobile. Access to markets may reduce certain climate-related risks for women (by reducing the risk of on-farm storage losses), but it can also increase them (by increasing their exposure to market price volatility). Women are often excluded from decision-making and may not benefit from adaptation technologies and practices that help better adapt to new climatic conditions. This situation not only has negative impacts on women, but also on their households, communities, and on the society as a whole, and affects agriculture production and sustainable development as well.

This gender gap means that climate change impacts are not experienced in the same way by men and women, boys and girls. These are a few of the gender-differentiated impacts in relation to agriculture¹³:

- a. Climate change increases labor requirements in agriculture; this may be felt in different ways by women and men depending on their responsibilities and roles.
- b. Climate change can exacerbate fear, entrenching gender-discriminatory social values that may in turn inhibit women's mobility, and differentially impact household and community decision-making

¹² UNDP, 2015

¹³ (a. – e. are adapted from UNDP, 2015. Gender responsive national communications toolkit.)

power and processes related to many areas including agriculture and income-generation and expenditures.

c. Outmigration of men for work may increase the stress and risk of female partners left behind and tasked with maintaining agricultural production in climate-stressed environment, and ensuring food and nutrition security for their household members

d. Disasters including deforestation, drought, etc. may impact the water supply and undermine food security. Women and children (generally) may have to walk further to collect water and firewood.

e. Increases in climate-related diseases and disaster imposes further burden on care-givers (most of whom are women), stressing their time and labor burden further, causing them to reallocate/reduce their time on agricultural activities.

f. Climate change can exacerbate existing gender inequalities in agriculture, but may also increase the role of women as agents of change as livelihood changes coincide with modifications to gender-based roles and responsibilities.

Addressing the gender gap in agriculture when planning for climate change impacts is likely to lead to better outcomes. A growing body of evidence demonstrates that more equal gender relations within households and communities lead to better agricultural and development outcomes, including increases in farm productivity and improvements in family nutrition. International consensus is growing that gender-differentiated impacts of climate change must be taken into account when designing and implementing climate change response strategies and projects.

Key Definitions

Adaptive capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences

Gender and sex: Are different but interlinked. Gender is a social attribute; sex is a biological attribute where individuals are almost always clearly male or female. Gender is about women and men, boys and girls and their relationship to each other in different groupings. It refers to the roles, behaviors, activities and attributes that a given society, at a given time, considers appropriate for men and women. Gender roles, attributes, and relations are socially constructed and learned through socialization processes. They are thus different between societies and at different points in history. Society shapes and normalizes these different roles behaviors, and relations. Sexual orientation also influences the roles and behaviors of individuals; different societies treat LGBTQ people with differing degrees of expectations and discrimination.

Resources for further learning

Aguilar, L., Granat, M. & Owren, C., 2015. Roots for the future: The landscape and way forward on gender and climate change. Washington, DC, IUCN & GGCA. Available at <http://bit.ly/1mClb9b>

Goh, A. H.X. 2012. CAPRI working paper 106: A Literature Review of the Gender-differentiated Impacts of Climate Change on Women's and Men's Assets and Well-being in Developing Countries. <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/127247>

Habtezion, S., 2013. Overview of linkages between gender and climate change. UNDP Available at <http://bit.ly/2qKn5MZ>

UNDP 2017. Empowering women to lead the way on climate change. Available at <http://www.undp.org/content/undp/en/home/blog/2017/empowering-women-to-lead-the-way-on-climate-change.html>

Videos:

FAO, 2011. [Closing the Gap between Men and Women in Agriculture](#).

WorldFish, 2014. [Gender Equality: Now](#)

Part II

2.1 NAPs and the International Frameworks for Climate Change, Sustainable Development and Disaster Risk Reduction

Experts: Cassie Flynn, Jennifer Baumwoll

Key Messages

- 1) The 2030 Agenda for Sustainable Development, the Paris Climate Change Agreement and the Sendai Framework on Disaster Risk Reduction have complementary objectives and actions that all relate to climate change adaptation.
 - 2) National Adaptation Plans are an important tool for achieving countries' National Determined Contributions and the Paris Agreement; but they also contribute to and are aligned with disaster risk reduction and sustainable development objectives
 - 3) National Adaptation Plans can provide a means to translate international agreements into national processes, while also ensuring alignment.
-

The 2030 Agenda, the Paris Agreement on Climate Change and the Sendai Framework for Disaster Risk Reduction set the world on a new pathway toward sustainable development. The three agreements set the foundation for international development cooperation for the next 15 years. Adaptation and National Adaptation Plans (NAPs) can play a very important role in the implementation of all three of these agreements.¹⁴

First, the 2030 Agenda for Sustainable Development was adopted by world leaders in September 2015; this Agenda sets forth 17 Sustainable Development Goals (SDGs) for all countries in the joint, global effort to end all forms of poverty. **One of the SDGs (13) has been dedicated to “taking urgent action to combat climate change,” demonstrating its importance for achieving sustainable development.** At the same time, several other goals are dependent on adapting to climate change, which threatens to push back SDG progress. This includes, for example, ending hunger, promoting sustained economic growth and employment, and restoring and sustaining natural resources and ecosystems. Specifically, **adaptation plays a critical role in SDG 2: “Zero Hunger.” This goal is only achievable if it takes into account climate change impacts, which threaten to reduce productivity and shock agricultural systems.** NAPs can contribute to strengthening the resilience of the agriculture sector and ensure food security, dietary diversity, and positive nutrition.

Second, adopted in December 2015, was the groundbreaking “Paris Agreement” at the 21st session of the Conference of the Parties (COP21) to the UN Framework Convention on Climate Change (UNFCCC). Under this agreement, all countries committed to reducing greenhouse gases and increasing their resilience to climate impacts. These commitments were defined by countries themselves, presented in Nationally Determined Contributions (NDCs), which form the basis for the Paris Agreement. Countries' NDCs outline their actions post-2020 to reduce emissions so as to meet an

¹⁴ National Adaptation Plans (NAPs) are defined in detail in the next section.

agreed long term goal to limit warming to 1.5 to 2 degrees C above pre-industrial levels and adapt to climate change.

Specifically, **Article 7 of the Paris Agreement establishes a global adaptation goal of: “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal.”** National Adaptation Plans contribute to outlining how each country would go about meeting this adaptation goal, and is a critical component of implementing NDCs and the Paris Agreement overall.

Third, the Sendai Framework on Disaster Risk Reduction 2015-2030 was adopted by UN Member States in March 2015 at the Third UN World Conference on Disaster Risk Reduction. This framework (building on the Hyogo Framework for Action 2005-2015), presents seven global targets and four priorities for action towards the aim for “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.” It is a voluntary, non-binding agreement among Governments, who take the lead in reducing disaster risk while sharing this responsibility with other stakeholders (local government, private sector, NGOs, etc.). The targets under the Sendai Framework relate to reducing the number of deaths, affected people, and economic loss caused by disasters, while also enhancing cooperation, strategies and availability of disaster-related information and assessments.

Given that 90% of recorded major disasters caused by natural hazards from 1995 to 2015 were linked to climate and weather (UNISDR), addressing disaster risk and adapting to climate change are complementary objectives. Actions defined by the Sendai Framework contribute to adaptation efforts across all four Sendai priority areas, including access to disaster-related information and early warning systems, establishing risk governance systems, investing in risk prevention and reduction, and building resilient recovery, rehabilitation and reconstruction after an event. At the same time, National Adaptation Plans include actions that contribute to these priorities, and should align components accordingly.

All three of these agreements set specific goals, targets or commitments that contribute to inclusive and resilient development outcomes in the face of climate change. As countries consider the agreements’ objectives, structures, and timeframes, there is an unprecedented opportunity to take an integrated approach to achieving these important agendas. The National Adaptation Plans are a critical tool to making that happen.

Abbreviations

United Nations Framework Convention on Climate Change (UNFCCC)

Nationally Determined Contributions (NDCs)

National Adaptation Plans (NAPs)

Resources for further learning

Alam M., Kohli K. and Mackay A. 2017. Embracing uncertainty while planning for resilience.

<http://news.trust.org/item/20171113105513-b5tl6>

For more information on the Paris Agreement:

http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

For more information on the Agenda 2030:

<https://sustainabledevelopment.un.org/post2015/transformingourworld>

Full text of the resolution adopting to the Agenda 2030:

http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

For more information on the Sendai Framework:

- The process: <http://www.unisdr.org/we/coordinate/sendai-framework>
- Full text of the Framework: <http://www.unisdr.org/we/inform/publications/43291>
- Useful chart of the framework: <http://www.preventionweb.net/publications/view/44983>

2.2 Introduction to NAP and NAPA

Experts: Rohini Kohli, Julie Teng

Key Messages

- 1) NAPAs were established in 2001 for LDCs and focuses on urgent and immediate adaptation needs.
 - 2) The NAP builds on the pre-existing NAPA process and Cancun Adaptation Framework and aims to address medium to long-term adaptation needs.
 - 3) Through NAPAs and NAPs countries can leverage additional support for planning and implementation of climate change adaptation actions.
 - 4) The formulation and implementation of the NAP is a continuous, progressive and iterative process, which follows a country-driven, participatory, and gender-sensitive approach.
 - 5) The NAP process aims to be fully rooted in the country's development planning framework and as such differs from country to country.
-

To address the challenges and impacts that climate change poses to development efforts, the decision was made to develop National Adaptation Programmes of Action (NAPAs) for climate change adaptation in Least Developed Countries (LDCs) at the seventh session of the Conference of the Parties (COP-7) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2001.

The NAPAs were to establish urgent and immediate priority needs for adaptation in LDCs, and were to focus on the immediate term. By 2016, all LDCs had submitted their NAPAs to the UNFCCC. After the establishment of the NAPA framework, LDCs sought to strengthen implementation of urgent and immediate climate change adaptation and the capacity to do so, in alignment with their respective national priorities and strategies. These included building:

- i) institutional capacities for establishing multi-stakeholder, transparent processes in which cross-sectoral adaptation needs and actions are identified, vetted and assessed; and
- ii) technical capacities for assessing on-going and future sources of vulnerability, and identifying corresponding adaptation actions.

By May 2017, 195 projects emanating from NAPAs were in various stages of the Least Developed Countries Fund (LDCF) project cycle – the Fund which was established under the Global Environment Facility (GEF) to support the formulation and implementation of NAPA priorities. Financing of more than \$1,147 million has been mobilized to the LDCF to support LDCs with implementation of their urgent and immediate adaptation needs. Additional financing has also been obtained from the Special Climate Change Fund (SCCF), the Adaptation Fund (AF), the Climate Investment Fund (CIF)'s Pilot Programme for Climate Resilience (PPCR), and through bi-lateral channels, among others.

Although progress was made to address immediate and urgent climate change impacts through the NAPA process, climate change planning had yet to systematically address longer-term adaptation needs. Consequently, a process was initiated at COP-16 (Cancun) to enable LDCs to formulate and implement National Adaptation Plans (NAPs). At COP-17 (Durban), Parties established the NAPs' objectives, namely: i) to reduce vulnerability to the impacts of climate change by building

adaptive capacity and resilience; and ii) to facilitate the integration of climate change adaptation in a coherent manner into new and existing policies, programmes and activities. The objectives pertain particularly to development planning, processes and strategies within all relevant sectors and at different levels, as appropriate. **This process was to be aligned with the principles established in the Cancun Adaptation Framework (CAF), and based on LDCs' experiences with NAPAs.** The Least Developed Country Experts Group (LEG) subsequently developed the Technical Guidelines for the NAP process, which were published in December 2012.¹⁵ Upon invitation of the COP, international organizations and other relevant partners started establishing support programmes, such as the UNDP-UN Environment NAP Global Support Programme, and the UNDP – FAO “Integrating agriculture into NAP” programme.

The analysis of the NAPA preparation and implementation shows that NAPAs provide a good starting point for adaptation planning, and that the NAP does not replace the need to address the urgent and immediate needs and concerns of the LDCs relating to adaptation to the adverse effects of climate change, as identified in the NAPAs. However, integrated sectoral impacts of climate change and adaptation were not systematically considered and NAPA priorities and implementation projects are typically sector-specific. **While NAPAs will continue to serve as important national policy tools that articulate urgent priority adaptation needs, the NAP process allows for additional support to LDCs to specifically bolster their medium- to long-term adaptation planning capacity within existing national planning processes at the national, cross-sectoral and local levels.** A medium- to long-term adaptation planning process requires that LDCs build on the lessons learned from many past and current efforts – including the recently completed NAPA process – in several respects, notably institutionally, technically, strategically and operationally.

Abbreviations

Least Developed Countries (LDCs)

National Adaptation Programme of Action (NAPA)

National Adaptation Plan (NAP)

Resources for further learning

For more information on NAPA:

http://unfccc.int/national_reports/napa/items/2719.php

For more information on NAP:

http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/7279.php

For more information on UNDP-UNEP NAP-GSP: <http://globalsupportprogramme.org/>

¹⁵ These are referenced and explored in more detail in Week 2.

2.3 Country voice from Uganda: Gender-Responsive Climate Change Adaptation Planning

Expert: Samuel Tumwesigye

Key Messages

- 1) Though climate change impacts all members of the society, existence of gender inequalities at both household and community levels make women particularly vulnerable.
 - 2) The entrenched patriarchal system determines the position of men and women in society, their entitlements, assets ownership and access, and therefore their respective capacities to adapt to climate change.
 - 3) Gender mainstreaming in adaptation planning should progressively address the structural constraints that disproportionately affect men, women, youths, and disabled persons.
 - 4) Gender differentiated adaptation challenges should be addressed at all levels of planning – community, district, regional and national levels.
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Men and women face differentiated impacts, different vulnerabilities and are at different risk levels to climate change. This situation is likely to be exacerbated if efforts to integrate gender concerns in climate change responses are neglected (Skinner 2011). More so the entrenched patriarchy system determines men's and women's position in the society, their entitlements and their adaptive capacities to climate change. In Uganda, women still have limited ownership, access and control over resources, especially land – only about 4% of rural women own land. Though climate change impacts all members of the society, the existing gender inequalities at both household and community level in Uganda make women more vulnerable than any other marginal group¹. It is also important to note that Uganda ranks as number 73 out of 102 countries on the Social Institutions and Gender Index (SIGI) devised by the OECD.

The implication is that adaptation planning and adaptation actions should integrate and reflect the needs of women and men so that, ultimately, their vulnerability to climate change impacts is reduced, as well as their adaptive capacity enhanced. All stakeholders involved in supporting adaptation actions and adaptation planning should have knowledge on ensuring gender-responsive adaptation planning. Cognizant of this, to build capacity and support mainstreaming of gender-responsive adaptation planning in the agriculture sector, all key stakeholders – from government institutions (national and sub-national levels), non-state institutions, development, international and national academic agencies, multilateral and bilateral development agencies, including UN agencies, and the private sector stakeholders should be involved.

In Uganda, several capacity building sessions have been planned and conducted involving planners at different levels. National level planners including members of parliament, central and local government level planners and staffs from the non-state institutions were categorized and trained in different sessions. Engaging stakeholders in different sessions enabled the country to adequately address the capacity gaps as far as gender responsive climate change adaptation planning is concerned.

The lesson learnt, and that is key to pay attention to, is that gender mainstreaming in adaptation planning should carefully take care of the structural constraints that limit adoption of technologies and practices even when they are most appropriate.

For example, if adaptation planning includes planting clonal (first maturing) tree species as an option to adapt to the impact of climate change, in contrast to planting or maintaining indigenous trees that grow much slower and therefore making availability of wood fuel more difficult, it is important to address issues of land ownership as a structural constraint that inhibit tree harvesting by women even if the women have planted them.

2.3 Country voice on NAPs Zambia

Experts: Arthur Asumani

Key Messages

- 1) Agriculture is vital to Zambia's development process and is one of its priority areas for rural economic development.
 - 2) Agriculture sectors in Zambia are highly susceptible to the negative effects of climate change.
 - 3) Zambia has embarked on the process of enhancing its resilience and adaptive capacity against the effects of climate change.
 - 4) Capacity building of individuals and institutions is vital for integrating agriculture into national development planning and budgeting processes.
 - 5) Zambia wants enhanced recording and production of evidence based results to improve up take of adaptation measures.
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Zambia's agriculture sector is a very important sector, as much of the population estimated at 70% of the rural populace derives their livelihoods from it. Family agriculture is the backbone of the rural economy and holds great potential for modernization due to its predominance; i.e. about 70 % of total production of the staple crop maize is produced by the small-scale farmers who are predominantly rural based. The country's population is still growing and this will ultimately put increasing pressure on natural resources. On the other hand, the growth in population guarantees labor supply in agriculture which is crucial to rural development. Currently the contribution of the agriculture sectors to the country's GDP is estimated at 9.7% and the government has identified it as a priority sector critical for achieving diversification, economic growth and poverty reduction in Zambia owing to its potential for improving rural socio-economic livelihoods and employment generation which currently stands as the largest contributor to employment in the country.

Despite the huge potential that exists in the agriculture sector, it is very sensitive to changing climatic conditions and is highly exposed to the impacts of climate change that negatively affect agriculture productivity and ultimately national food security. **It is estimated that the impacts of climate change would cost the country approximately 0.4% of annual economic growth and other effects such as rainfall variability could lead to losses estimated at 0.9% of GDP growth over the next 10 years thereby increasing the poverty levels.**

Zambia has embarked on actions aimed at reducing vulnerability to climate change impacts by building adaptive capacity and resilience and this is being done through the process of adaptation planning by integrating agriculture sectors in national adaptation planning for the medium to long term. Building on the gains of the initial adaptation measure that dealt with immediate and short term needs, the National Adaptation Plans of Actions (NAPAs). The NAPA focused on urgent and immediate adaptation needs of concise nature which could have been very costly if not addressed immediately.

In Zambia, the NAP is considered to be a process as well as a document. The process involves mainstreaming climate change adaptation into all national development plans and budget. The product

will then me a plan that articulates which programmes and projects will be implemented by relevant sectors. Economically important and vulnerable to climate change sectors in Zambia are agriculture, but also water, energy, health, education and others.

Building on its **National Climate Change Response Strategy (NCCRS)**, Zambia started to develop its NAP in 2014 with workshops and briefing for planning officers and decision makers, predominantly from the government institutions. During the workshops, the **Ministry of National Development Planning** was assigned the mandate to coordinate the NAP process, through its Interim Climate Change Secretariat, and the **Ministry of Finance** to mobilize needed resources. The role of providing climate information was assigned to Zambia's **Meteorology Department and Disaster Management and Mitigation Unit**. All other agencies were assigned an implementation role. The NAP process is now anchored in **Zambia's 7th Development Plan**.

The next steps of the NAP process will involve:

- Addressing capacity gaps and weaknesses in undertaking the NAP process
- Comprehensively and iteratively assessing development needs and climate vulnerabilities
- Taking stock of, or identifying available information on, climate change impacts, vulnerability and adaptation and assess the gaps and needs of an enabling environment for the NAP process.

Resources for further learning

National Climate Change Response Strategy (NCCRS). Zambia, (2010). Available here: <http://www4.unfccc.int/nap/Documents/Zambia%20Climate%20Change%20Response%20Strategy.pdf>

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MOOC videos

NAP-Ag MOOC Welcome Remarks 1. Dr. Pradeep Kurukulasuriya, Head of Climate Change Adaptation, UNDP welcomes all participants of NAP-Ag MOOC. Watch here: <http://bit.ly/2zZP67L>

NAP-Ag MOOC Welcome Remarks 2. Dr. Martin Frick, Director of Climate and Environment Division, FAO introduces the MOOC and national adaptation planning. Watch here: <http://bit.ly/2zMOijW>

Week 1 Part 1 - Introduction to National Adaptation Plans Watch here:

<https://www.youtube.com/watch?v=zALfDKWiXvk&list=PLyBRsrYRs7YfwMYIxBV41CPwMgeC1e-h&index=1>

Week 1 Part 2 - International Agreements on Climate Change. Watch here:

<https://www.youtube.com/watch?v=A7jzUGUDggo&list=PLyBRsrYRs7YfwMYIxBV41CPwMgeC1e-h&index=2>

Zipora's Story:

Episode 1. Watch here:

<https://www.youtube.com/watch?v=E4fOJHypQb4&list=PLyBRsrYRs7YfwMYIxBV41CPwMgeC1e-h&index=13>

Episode 2: Watch here:

https://www.youtube.com/watch?v=R6hOTnJvD_Y&index=14&list=PLyBRsrYRs7YfwMYIxBV41CPwMgeC1e-h

