



Republic of Uganda

**MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND  
FISHERIES**

**GUIDELINES FOR MAINSTREAMING CLIMATE CHANGE  
ADAPTATION AND MITIGATION IN AGRICULTURAL  
SECTOR POLICIES AND PLANS**

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## Mainstreaming Climate Change Adaptation and Mitigation in the Agricultural Sector Policies & Plans

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## ACRONYMS AND ABBREVIATIONS

ASSP	Agriculture Sector Strategic Plan
BFP	Budget Framework Paper
CAO	Chief Administrative Officer
CC	Climate Change
CCMA	Climate Change Mitigation and Adaptation
CCD	Climate Change Department
DDP	District Development Plan
FAO	Food and Agricultural Organization
GHG	Green House Gases
GoU	Government of Uganda
IITA	International Institute of Tropical Agriculture
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDGs	Millennium Development Goals
MoLG	Ministry of Local Government
MoFPED	Ministry of Finance, Planning and Economic Development
MWE	Ministry of Water and Environment
NAPA	National Adaptation Programme of Action
NDP	National Development Plan
NEMA	National Environment Management Authority
NGO	Non-Government Organization
NPA	National Planning Authority
OPM	Office of the Prime Minister
PACCA	Policy Action on Climate Change Adaptation
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention for Climate Change
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development

## FOREWORD

The Government of Uganda recognizes climate change as one of the greatest challenges affecting agricultural production and productivity. Both the NDP II and ASSP emphasize the need to implement measures to increase the country's resilience to climate change.

The impacts of climate change in the Agricultural Sector are evident and include increasing temperatures, frequent droughts, flooding, prolonged dry spells, hailstorms, landslides, lightening, pests and disease epidemics and shifts in rainy seasons. These impacts of climate change have implications on economic development of Uganda since the majority of the population depends on agriculture.

These guidelines were developed with the main objective of providing practical, step-by-step guidance for all stakeholders in agriculture sector, including the MAAIF Agencies and Local governments, on how to mainstream climate change adaptation and mitigation in their planning and decision-making processes.

These guidelines are in line with the National Guidelines for Climate Change Mainstreaming Ministry's vision of **"A competitive, profitable and sustainable agricultural sector"** and the **Global Climate Change Protocols** as recommended by the United Nations Convention on Climate Change.

I am therefore pleased to present to you these guidelines as a practical tool to guide the policy makers and other stakeholders in developing and implementing climate change-responsive policies and plans.

Together we shall make the agricultural sector more adaptive and resilient to the effects of climate change.

For God and My Country



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## 1 INTRODUCTION

### 1.1. Agriculture and Climate Change in Uganda

The Agriculture Sector in Uganda is experiencing the impact of climate change which is evidenced by increasing temperatures, frequent droughts, flooding, prolonged dry spells, hailstorms, landslides, lightening, pests and disease epidemics for livestock and crops and shifts in rainy seasons (USAID, 2013; MWE, 2014a).

Recent reports indicate that climate change is affecting the value chains of crops, livestock and fisheries causing food insecurity, malnutrition, poverty and high cost of living among many households in the country (Orindi & Eriksen 2005; Orindi & Murray 2005; Goulden 2008; MWE 2007; USAID, 2013).

In 2014, the flooding of River Nyamwamba in the Mt. Rwenzori region led to serious soil erosion and destruction of infrastructure both on the hill slopes and down the valleys. In 2007, the Teso region experienced its heaviest rainfall in 35 years (OCHA, 2010) which caused extensive flooding. During this period, an estimated 50,000 households were affected, many people faced food insecurity due to pre and post-harvest losses of their first and second season crops and water and sanitation facilities were severely impacted (NEMA, 2008). Furthermore, in 2007, Eastern and Northern Uganda experienced heavy rains that resulted in severe floods which affected the livelihoods of thousands of people, destroyed crops and led to increase in water borne diseases. In Kapchorwa District, about 300 hectares of wheat were destroyed. Nationally, coffee exports dropped by 60% between October and November 1999, partly due to disrupted transport system. In Butaleja district in the eastern region of Uganda, in March 2010, floods submerged crop fields and vital infrastructure including trunk and rural roads which disrupted transport of food (OCHA, 2010).

The unusually heavy rains in March 2010 caused landslides in the Bududa district which is found in the Mount Elgon region and buried three villages including crops and caused numerous deaths of livestock. In 2011, the District of Bulambuli was also strongly affected by landslides, which destroyed homes and crops (MWE, 2014a).

Drought is the most prominent effect of climate change in Uganda as exhibited by the increased frequency of droughts with seven serious droughts experienced between 1991 and 2000 (GoU, 2007). In the north-eastern Karamoja region, consecutive years of crop failure and low livestock productivity due to erratic weather conditions and below normal rainfall have also had a strong and adverse impact on food security throughout the sub-region.

In terms of economic impact, the drought in 2008 caused losses of approximately 3% of the value of all food and cash crops that year (NEMA, 2008). Two years later, the country suffered economic losses of US\$470 m in food crops, cash crops and livestock as a result of the 2010/11 drought (OPM, 2012). This is about 16% of the total annual value of these crops in 2011.



Uganda is experiencing significant evidence of global warming which is an increase in the Earth's temperature due to an increase in heat-trapping gases, referred to as greenhouse gases (GHGs). Time series data analysis over a 30-year period from 1970 to 2000 indicates an increase of the minimum temperature as well as the maximum temperature, with a notable increase of approximately 0.5-1.2°C for minimum temperatures and 0.6-0.9°C for maximum temperatures. The mean annual temperature in Uganda is projected to increase between 0.7°C and 1.5°C by the 2020's and between 1.3°C and 4.3°C by 2080's (Hepworth & Goulden 2008).

The current and past trends indicate increase in rainfall variability and shifts in seasons. The onset of rainy seasons in some years show shifts by 15 to 30 days (earlier or later), while the length of the rainy season shows changes of 20 to 40 days in some years. Global Circulation Models (GCMs) predict an increase in annual rainfall of 10-20% during the 21<sup>st</sup> century and a change in the seasonal distribution of rainfall which is likely to increase from December to February and decrease from June to August (MWE, 2014a).

An increase in the severity and frequency of extreme events such as floods, droughts, heat waves and storms is expected. Huntingdon et al. (2005) using four Global Circulation Models (GCMs) suggest that the number of extremely dry and extremely wet years will increase, and some models suggest a 20-30% increase in extreme wet seasons at a medium Carbon Dioxide emission scenario (IPCC 2007). Landslides in higher regions and floods in lowland areas have been particularly destructive for livelihoods, while increasing intensity of rain has caused soil erosion (MWE 2007). Such disasters can be extremely damaging to agricultural infrastructure.

Climate change over time may be due to natural variability or as a result of human-induced increase in greenhouse gases (GHGs) in the atmosphere. The agricultural sector contributes to climate change by emitting GHGs mainly carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) (MWE, 2014a). Livestock account for 9%, 35-40% and 65% of global emissions of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O respectively into the atmosphere.

In the last 50 years these emissions have significantly increased the concentrations of GHGs in the atmosphere, resulting in offsetting the natural equilibrium and hence warming the earth's surface, which has resulted in global climate change. With projected increase in agricultural production, particularly livestock production, GHG emissions are likely to increase, leading to increase in temperature (FAO Statistics Yearbook 2013; Kabasa et al, 2007).

### **1.2. Gender and Climate Change**

Impacts of climate change have negative implications on food and water availability. This affects women and men differently due to their differing roles and responsibilities in society. The poorest, the majority of who are women are the most vulnerable. It is increasingly evident that involving women and men in all decision-making processes for climate change mitigation is a significant factor in meeting the climate change challenge.

The potential effects of climate change on women (both direct and indirect) are outlined in Table 1 below.

**Table 1: Direct and indirect risks of climate change and their potential effect on women**

Climate change effects	Potential risks	Examples	Potential effect on Women
<b>Direct</b>			
	Increased air Temperatures	Shifts in the viable area suitable for coffee and reduced maize output	Women are responsible for food security at household level. Reduced maize will impact on food security of families
	Increased drought & water shortage	Reduction in grazing potential in the cattle corridor. Karamoja has experienced consecutive years of crop failure and low livestock productivity due to erratic weather conditions and below normal rainfall – poor water and pasture availability	In situations where food is limited, women prioritize feeding Children and men first, reducing their own food intake. Men and young boys migrate with cattle, in search of water and pasture, leaving women, children and the elderly without food. Women walk long distances to fetch water.
	Increased flooding	In 2007, the eastern Teso region experienced its heaviest rainfall in 35 years, In March 2010, floods occurred in Butaleja district	Women are responsible for food security at household level. Many households were faced with food insecurity due to the loss of their first and second season harvests and when floods submerged crop fields.
	Increased rainfall & shift in seasonality	Following unusually heavy rains, landslides occurred in Bududa district in March 2010 and in Bulambuli district in 2011.	Women were affected by landslides, which destroyed homes and crops
<b>Indirect</b>			
	Increased or resurgence of crop pests and diseases	Cassava brown streak in 2005, Cassava mosaic, Banana bacterial wilt in 2001, Coffee wilt disease in 1993; Coffee mealybugs, Coffee	Poorer households have fewer resources to use to adapt to climate change impacts such as procuring disease

		stem borers, White flies, and Leaf rusts on coffee in highland areas	tolerant varieties.
	Decreased crop Production	Crop production is expected to decline 20–50% in response to extreme El Niño-like conditions.	Rural women in Uganda provide over 77% of labour force in agricultural production yet 61.3 % of women do not possess ownership of land and continue to find challenges in accessing other factors of production (credit, extension service) which affect long-term investments on land.

### 1.3. Why mainstreaming climate change in Agricultural Sector policies and plans is important

Several reasons justify the need for mainstreaming of climate change adaptation and mitigation in agricultural sector policies and plans.

One main reason is because the biophysical and socio-economic impacts of climate change and variability have implications on the entire agricultural sector.

Secondly, the mainstreaming of climate change mitigation and adaptation into agricultural sector policies and plans supports wider ownership of the climate response and allows drawing on a wider pool of financial and human resources for implementation, and promotes more widespread capacity and institutional building.

The *benefits* of integrating climate change mitigation and adaptation at the strategic planning levels in the sector include more integrated responses based on a more comprehensive understanding of linkages, opportunities, risks and constraints; more effective responses through better coordination across sub-sectors and between various levels of governance, more efficient responses through more enlightened prioritization and allocation of resources; and all this results in more timely sustainable responses.

In line with the 1995 constitution of Uganda, sections XI (i) and XXI (a), the Agricultural sector is mandated to provide overall guiding policy and legislation frameworks which provide guidance to local governments and other stakeholders in the agricultural sector. The policies, plans and projects developed by MAAIF contribute to the operationalization and implementation of the National Development Plan and other National obligations related to agriculture such as Climate Change Ratification to UNCCC.

MAAIF is therefore obliged to develop/review policies and plans that implement actions in response to climate change which is affecting the agricultural sector. MAAIF is also responsible for mobilizing resources to implement these actions.

The Agricultural Sector Strategic Plan provides overall guiding policy and legislation frameworks for local governments and other investors in the sector and this provides a great opportunity and entry points for climate change integration.

The regulatory frameworks (legislations and regulations) should promote adaptation and mitigation capacities and reduce vulnerabilities of communities to effects of climate change while increasing resilience of communities to climate change.

Mainstreaming climate change at Local Government level is important since the impacts on development are best observed and understood at the local level. For most options for adaptation to be effective, they require the implementation of the initiatives to be pioneered at the local level for ease of replication and scaling up.

### **1.4. Process of preparing the Guidelines**

The preparation of these guidelines was based on a comprehensive desk review of literature (published and unpublished) on climate change in Uganda and analysis of reports from seven regional consultative workshops.

The workshops were conducted in Western, Central, South West, West Nile, Northern, Eastern and Karamoja regions from November 2014 to July 2016 involving farmer representatives and Local Government staff including Production and Natural Resource Officers from each one of the districts. Farmers and district technical staff provided information on observed impacts of climate change in the sub-sectors of crop, livestock and fisheries in each region, the vulnerable areas and the coping strategies and actions by communities. In addition, consultations were held with the Climate Change Taskforce of MAAIF and other stakeholders in climate change to share their experiences in mainstreaming climate change in the sector strategies and plans. The guidelines were aligned to the national guidelines for mainstreaming climate change mitigation in sector plans and budgets developed by the National Planning Authority in collaboration with the Climate Change Department.

## 1.5. Goal

The goal of the guidelines is **to ensure that interventions developed and implemented within agricultural sector address climate change issues through activities of mitigation and adaptation.**

## 1.6. Main Objective

The main objective of the guidelines is **to provide practical, step-by-step guidance for all agricultural sector stakeholders including MAAIF, the Agencies of MAAIF and Local governments, on how to mainstream climate change adaptation and mitigation in their planning and decision-making processes.**

## 1.7. Specific Objectives

The objectives of these guidelines are:

- (i) To present a comprehensive understanding of what mainstreaming climate change adaptation means
- (ii) To provide detailed guidance, including basic steps and tools, on how mainstreaming climate change adaptation and mitigation in agriculture can be put into practice
- (iii) To identify the key climate change risks that affect the delivery of the sector interventions
- (iv) To serve as a reference tool to MAAIF and its stakeholders on the adaptation and mitigation measures to address climate change risks in the agricultural sector
- (v) To identify entry points for integration of climate change mitigation and adaptation measures;
- (vi) To provide a framework for monitoring and evaluation of the integration of climate change adaptation and mitigation in the agriculture sector

## 1.8. Scope of the Guidelines

The guidelines cover the sub-sectors of crop, livestock and fisheries under the Ministry of Agriculture, Animal Industry and Fisheries.

## 1.9. Users of the Guidelines

The guidelines were primarily designed for use by technical staff, economists and planners in the Ministry of Agriculture, Animal Industry & Fisheries and its Agencies as well as the staff of Local Governments who are involved in Policy development and planning as well as other interlinked Ministries and Agencies.

Technical staff in the sub-sectors will gain a better understanding of the ways in which mainstreaming climate change adaptation and mitigation will improve sub-sector work plans, and can subsequently incorporate mainstreaming into their monitoring and evaluation systems, while also allocating adequate budgetary resources.

## 1.10. Organization of the Guidelines

The guidelines consist of 3 sections:

**Section 1: Introduction** provides a basic understanding of the concepts that underpin climate change and the implications of climate change in crops, livestock and fisheries sub sectors. It also describes the impacts of climate change in crops, livestock and fisheries sub sectors and outlines the adaptation measures.

**Section 2: Process of mainstreaming Climate Change Adaptation** describes the steps for mainstreaming climate change and the institutional setting for actions to mitigate and adapt to climate change to ensure climate change concerns are integrated into agricultural policies, and plans. It also describes the entry points in the Agriculture Sector policy cycle and main stakeholders involved in mainstreaming climate change in agriculture sector policies, or plans.

**Section 3: Tools for mainstreaming Climate Change Adaptation** defines the key climate change concepts and describes the tools, checklists, and indicators for monitoring climate change mainstreaming in agriculture sector policies and plans.

## 2 POLICY AND INSTITUTIONAL FRAMEWORK TO SUPPORT CLIMATE CHANGE MANAGEMENT IN AGRICULTURE SECTOR IN UGANDA

### 2.1 Policy Framework for Climate Change in Agriculture sector

In recent years, Uganda has taken a number of steps to create an enabling policy environment and to integrate measures to adapt and mitigate climate change in national policy frameworks and plans. Uganda signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and the Kyoto Protocol (KP) in 2002. This obliges Uganda to put in place appropriate mitigation and adaptation measures to address the cause and effects of climate change. These treaties have been domesticated through the development of the Uganda National Adaptation Plan of Action (NAPA) which was launched in 2007; and the formulation of the National Climate Change Policy (NCCP) launched in 2014, which aims at guiding all climate change activities and interventions in the country. The NCCP focuses on providing direction for the key sectors that will be affected by the impacts of climate change, facilitating adaptation, and strengthening coordinated efforts amongst sectors towards building an overarching national development process that is more resilient. In addition, guidelines for integrating climate change in sectoral and local development plans and budgets have also been put in place.

At national level, the government developed a five-year National Development Plan (NDP I) for 2010/11 to 2014/15 which expired in June 2015 and was replaced by the second National Development Plan (NDP II) 2015/16 to 2019/20. Both NDP I and NDP II recognize that climate change potentially poses one of the greatest challenges for Uganda to realize its Vision 2040.

NDP II identifies agriculture as one of the primary growth sectors which produce goods and services and recognises that investing in agriculture to achieve a higher sector growth rate is the surest way of effectively reducing poverty. It is for this reason that agriculture is being given attention in national development. Objective 5 of Agriculture section in NDP II aims at increasing Uganda's resilience to climate change.

In 2015, MAAIF developed the Agriculture Sector Strategic Plan (ASSP) as a Medium-Term Plan of the Ministry to clarify and elaborate the objectives and outputs for the agricultural sector, and to bring out priority areas for spending between 2015/16 to 2019/20. The ASSP has been developed using lessons and experiences from the Agricultural Sector Development Strategy and Investment Plan (DSIP), which was implemented from 2010/11 to 2014/15.

The ASSP has a section on cross cutting issues which includes support to environment and climate change adaptation. The aim is to incorporate environment and climate change adaptation in all technologies and agricultural practices across all the agricultural zones. MAAIF has an established a Climate Change Task Force whose main role is to ensure that climate change is integrated in MAAIF policies and plans to ensure that appropriate measures are mainstreamed in all the sector's development interventions.

Although the NDP II and ASSP have integrated climate change, and recognized that climate change is a development challenge, their implementation has not been adequate. The MAAIF National Agricultural Policy, and subsector policies have not adequately integrated the urgent issues of mitigation and adaptation to climate change. This leaves the national and district development planning processes less guided in terms of climate change mainstreaming and the farming communities highly vulnerable and exposed to negative impacts of climate change and variability. As a result, this has deprived the agricultural sector to benefiting from the available funding opportunities to climate change adaptation and mitigation.

## **2.2 The Agriculture Sector Policy and Planning Process at National and Local Government Levels**

Uganda's Agricultural sector is structured in a decentralized framework that comprises of 2 levels: the central government and planning level and district local government level. MAAIF's policies and plans are designed and implemented in the context of the country's Vision 2040, and achieving the agriculture targets as stipulated in Sustainable Development Goals (SDGs).

The National development plan (NDP II) is Uganda's medium term strategy aimed at achieving the Uganda Vision 2040.

At sector level, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) has developed the Agricultural Sector Strategic Plan (ASSP) as a strategic and budgetary framework for agricultural development to implement the agriculture priorities stipulated in the NDP II. The priorities outlined in ASSP will be implemented through a sector wide approach that will involve both government and non-government actors at national and Local Government levels.

At the district local government level, all departments will ensure that climate change issues are integrated into District Development Plans. Indicative Planning Figures for each sub-sector to ensure they can address climate change adaptation and mitigation measures, along with the setting of relevant performance indicators. Each year, a single Budget Framework Paper is prepared by each District Technical Planning Committee, with input from the District Production Department. In principle, the essence of the District Budget Framework Paper should be the coordination of plans submitted from sub counties and developed in a participatory manner. Aside from funds that are directly under the control of the local governments, many production activities in the district are also supported by off-budget projects financed by donors and/or NGOs.

### **2.3 Institutional Framework for mainstreaming Climate Change in Agriculture sector**

There are a number of key stakeholders relevant to mainstreaming climate change in Agriculture sector policies and plans. These include government institutions, a number of non-governmental institutions and development partners.

Figure 1 gives a map of the key stakeholders in relevant to mainstreaming climate change in agriculture sector policies and plans in Uganda.



Figure 1: Key stakeholders relevant to climate change mainstreaming in Uganda



### 2.3.1 Government institutions

A number of government ministries, departments and agencies have responsibilities related to the management of climate change. These include:

- Ministry of Agriculture, Animal Industry and Fisheries (MAAIF):** Responsible for coordination and monitoring of mainstreaming climate change in Agriculture sector policies and plans in Crop, Livestock and Fisheries sub sectors. MAAIF Climate change task Force and Focal point for UNCCD are based in MAAIF. The MAAIF sub sector departments and MAAIF Agencies, including CDO, UCDA, NAADS, NARO, and COCTU are responsible for implementation of climate change adaptation and mitigation measures in the agriculture sector.
- The Climate Change Department (CCD) of the Ministry of Water and Environment:** The CCD coordinates all climate change matters in Uganda. The main functions of the CCD are (i) Acting as an information clearinghouse on climate change concerns; (ii) Providing policy and strategic advice on climate change, (iii) Supporting communication and outreach on climate change; (iv) Ensuring the integration of climate change concerns into overall national planning through coordination with the relevant ministries, departments and governmental agencies; (v) Providing secretarial services to the National Climate Change Policy Committee, the National Climate Change Advisory Committee and the CDM-Designated National Authority; (vi) Monitoring the implementation of the Climate Change Policy and its Implementation Strategy,

(vii) Serving as the National Focal Point for the United Nations Framework Convention on Climate Change (UNFCCC).

- **The National Planning Authority (NPA):** The functions of NPA are to: (i) Ensure that the ministries, departments and agencies concerned integrate climate change through adequate provisions in their annual work plans for the implementation of the climate change policy, building on the guidance provided in the costed implementation strategy but consistent with all relevant national policies and legislations; (ii) Ensure that these agreed work plans are implemented, through a review of quarterly and semi-annual reporting by the institutions concerned and appropriate follow-up actions by the NPA.
- **Ministry of Finance, Planning and Economic Development:** The functions of MoFPED are to (i) Ensure that national-, sectoral- and district-level budgets and indicative planning figures integrate climate change through appropriate provisions for the implementation of the policy and its strategy; (ii) Review quarterly and semi-annual reports from the ministries, departments and agencies concerned, to ensure that resource use is in line with expected and actual progress in implementing the policy; (iii) Facilitate the introduction of relevant financial mechanisms and tools to the relevant stakeholders, as per the implementation strategy, to support financial resource mobilisation and investment for the implementation of the policy.
- **MAAIF departments:** The various departments under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) responsible for crop, livestock and fisheries sub sectors in Uganda.
- **Department of Disaster Management in the Office of Prime Minister:** The Department for Relief, Disaster Preparedness and Management (DRDPM-OPM) in the Office of the Prime Minister (OPM) is responsible for multi-sectoral coordination and collaboration in disaster risk reduction.
- **Ministry of Local Governments (MoLG):** The functions of MoLG are to (i) Provide guidance to the districts to translate the policy priorities and the implementation strategy into coherent plans at the district level; (ii) Ensure that districts make adequate provisions in their development plans, annual plans and budgets for the implementation of the climate change policy; (iii) Ensure that these are acted upon as planned through a review of relevant reports from the districts and appropriate follow-up actions by the MoLG, as required.
- **National Environment Management Authority (NEMA):** The function of NEMA is to ensure sound environmental management and biodiversity conservation in Uganda.
- **Uganda National Meteorological Authority (UNMA):** The function of UNMA is to coordinate climate and weather related information and acts as a focal point for Inter-Governmental Panel on Climate change (IPCC).
- **Ministry of Gender, Labour and Social Development:** responsible for climate-sensitive policies to narrow the gender gap and empower women to help reduce these impacts of climate change.

- **Academia: Universities and Tertiary institutions:** Involved in studies and research in climate change
- **National Agricultural Research Organization (NARO):** Development of climate change adaptation and mitigation technologies.

### **2.3.2 Development Partners**

The need to mainstream adaptation and mitigation to climate change in the agriculture sector is increasingly recognized, and several bilateral and multilateral development agencies have taken interest in Uganda. These include United Nations Development Programme and other UN agencies such as FAO and UNEP; EU, DANIDA, GIZ, UK Aid/DFID, World Bank, USAID, NODIC, AfDB, and JICA. Development partners provide budget support or finance projects in the agricultural sector.

### **2.3.3 Civil Society Organizations**

A number of civil society organizations have facilitated the formation of a coalition of organizations (the Climate Action Network such as the Uganda/CAN-U) which is a platform for lobbying and advocacy to enable a strong united voice within civil society, with more than 40 members.

### **2.3.4 Private Sector**

This includes farmers, FBOs, cooperatives, processors and service providers such as business associations/private sector foundations.

**Table 2: Key Stakeholders and their roles in mainstreaming climate change adaptation and mitigation in Agriculture Sector**

Stakeholder/ Institution	Roles / Responsibilities
<b><i>Government Institutions</i></b>	
MAAIF	<ul style="list-style-type: none"> <li>• Develop policy, plans and regulations that support climate change adaptation and mitigation</li> <li>• Implement and monitor interventions in the agriculture sector related to climate change</li> <li>• Mainstream climate change in monitoring and evaluation framework</li> <li>• Monitoring and backstopping the District Local Governments</li> <li>• Lobby for funds from donors, private sectors, investors etc. for implementing Climate Change Mitigation programmes</li> <li>• Collect information on Climate change adaptation and mitigation for onward consolidation into work plans</li> <li>• Build capacity of MAAIF and Local governments in Climate Change</li> </ul>
MOFPED	<ul style="list-style-type: none"> <li>• Integrate climate change adaptation within the national budgeting and public finance management processes</li> <li>• Work with different ministries to mobilize external funding for climate change financing</li> <li>• Establish a contingency fund to handle climate change related disasters that are beyond the planned/ expected/or foreseen</li> </ul>
NPA	<ul style="list-style-type: none"> <li>• Coordinate, manage and evaluate frameworks, systems and strategies for cost-effective and participatory national development planning in Uganda.</li> <li>• Check the guidelines for proper alignment to sector-wide format</li> <li>• Issue a Certificate of compliance to sectors</li> </ul>
CCD	<ul style="list-style-type: none"> <li>• Participate to coordinate mainstreaming efforts at national level</li> <li>• Develop and implement performance monitoring framework for climate change</li> </ul>
MoLG	<ul style="list-style-type: none"> <li>• Promote and harmonize climate change responses at both the national and local levels</li> <li>• Guide Local Governments on how best to incorporate climate change provisions in district development plans</li> <li>• advocate for resource allocation to Local Governments for climate change responses</li> </ul>
OPM	<ul style="list-style-type: none"> <li>• The Department for Relief, Disaster Preparedness and Management in the Office of the Prime Minister (OPM) is responsible for multi-sectoral coordination and collaboration in disaster risk reduction.</li> </ul>
MWE	<ul style="list-style-type: none"> <li>• Overall planning, policy formulation, coordination and guidance in the water resources sector.</li> <li>• To develop policy, planning and regulatory frameworks for the</li> </ul>

Stakeholder/ Institution	Roles / Responsibilities
	national or local government level on various issues such as irrigation, environment, equitable access, etc. <ul style="list-style-type: none"> <li>• To allocate sustainable financing for national and sub-national water management;</li> <li>• Technical guidance, scrutiny, clearance and monitoring of projects.</li> </ul>
Ministry of Energy and Mineral Development	<ul style="list-style-type: none"> <li>• To promote sustainable energy access and utilisation as a means of sustainable development in the face of uncertainties related to climate change</li> </ul>
Ministry of Works and Transport	<ul style="list-style-type: none"> <li>• To develop and ensure integrated planning and management of transport and other physical infrastructure that build on insights from climate predictions</li> </ul>
Local Governments	<ul style="list-style-type: none"> <li>• Mobilize communities and sensitize them on climate change causes and effects</li> <li>• Integrate climate change adaptation into the District Development Plans</li> <li>• Develop and implement climate change adaptation micro-projects at the community level</li> <li>• Monitor and report on climate change mitigation programmes in local governments</li> <li>• Consider making ordinances/bye laws that will help in addressing climate change issues</li> <li>• Develop ordinances and bye-laws that enforce implementation of adaptation and mitigation measures e.g. bush burning</li> </ul>
Uganda National Meteorological Authority (UNMA)	<ul style="list-style-type: none"> <li>• Development of tools for assessing current and future impacts, vulnerabilities and risks. e.g. early warning and longer-range forecasting systems for climate events such as droughts, floods, storms, famine, disease epidemics, pest outbreaks</li> <li>• Signal the possible occurrence of disasters and epidemics with a lead time of a few days/ weeks / months</li> </ul>
Farmer Organizations	<ul style="list-style-type: none"> <li>• Give feedback throughout the policy processes</li> </ul>
Local communities	<ul style="list-style-type: none"> <li>• Identify and use relevant indigenous knowledge</li> <li>• Hold different actors accountable in terms of service delivery</li> <li>• Shape the policy and through t the entire policy cycle</li> <li>• Take action on adaptation and mitigation</li> </ul>
<b>Non-Government Organizations</b>	
Private sector	<ul style="list-style-type: none"> <li>• Develop climate change awareness toolkits for their staff and clients</li> <li>• Develop climate change related technologies</li> <li>• Implement climate change adaptation/ mitigation projects e.g. energy saving technologies, provision of clean water and waste management services</li> <li>• Contribute to climate change policy formulation</li> </ul>

Stakeholder/ Institution	Roles / Responsibilities
Civil Society Organizations	<ul style="list-style-type: none"> <li>• Generate and disseminate climate change adaptation and mitigation information and support tools</li> <li>• Mobilize and sensitize community members and leaders about climate change and its effects on different sectors</li> <li>• Develop and implement community projects for climate change adaptation</li> <li>• Mobilize financing for climate change adaptation and mitigation actions at community level</li> <li>• Integrate climate change adaptation issues into CSOs' advocacy and communication strategies</li> <li>• Build capacity of local development actors (including faith-based organizations) in climate change adaptation and mitigation</li> <li>• Participate in policy formulation and implementation</li> </ul>
Development Partners	<ul style="list-style-type: none"> <li>• To provide financial and technical assistance to develop capacity, formulate policy and planning frameworks, dissemination and education.</li> </ul>
Media	<ul style="list-style-type: none"> <li>• Publicize climate change actions using both electronic and print media,</li> <li>• Mobilize, sensitize and raise awareness e.g. Farmers' Advisory messages</li> </ul>
Cultural institutions	<ul style="list-style-type: none"> <li>• Mobilize and sensitize communities about climate change</li> <li>• Contribute indigenous knowledge (IK)</li> </ul>
Faith-based organizations	<ul style="list-style-type: none"> <li>• Mobilize and sensitize different actors on climate change</li> </ul>

### 3 MAINSTREAMING CLIMATE CHANGE ADAPTATION AND MITIGATION IN AGRICULTURE SECTOR POLICIES AND PLANS

#### 3.1 Entry Points and opportunities for mainstreaming climate change mitigation and adaptation in the Agricultural Sector policies and plans

An entry point provides one or more opportunities for incorporating specific climate change adaptation and mitigation considerations into a given policy, strategy, or plan. There are three stages of the policy cycle namely formulation, planning, resource allocation and implementation. The 2 levels of policy processes (sector and local government level) provide entry points for mainstreaming climate change mitigation and adaptation in agriculture sector policies and plans.

**Table 3: Entry points for mainstreaming climate change in agricultural sector policies and plans**

POLICY CYCLE STAGE	AGRICULTURE SECTOR LEVEL	DISTRICT LOCAL GOVT LEVEL
Policy formulation /review	<ul style="list-style-type: none"> <li>- Preparation of Agricultural Policy and Sub-sector policies (crop, livestock and Fisheries);</li> <li>- Preparation of agriculture-specific legislation / regulations</li> <li>- Preparation of agricultural sector budget (e.g. Budget Framework Papers)</li> <li>- Reviews of agricultural policies, Acts and regulations</li> <li>- Formulation of regional policies and strategies related to agriculture, i.e. EAC, COMESA, IGAD, AU</li> <li>- Formulation of policies for line ministries such as water policies, Land use policies.</li> <li>- Developing climate-smart M&amp;E framework for policies and plans</li> </ul>	<ul style="list-style-type: none"> <li>- Preparation and reviews of Decentralization policies</li> <li>- Development of Bye-laws and Ordinances</li> </ul>
Planning	<ul style="list-style-type: none"> <li>- Develop and review Agricultural Sector Strategic Plan (ASSP)</li> <li>- Develop Policy statement</li> </ul>	<ul style="list-style-type: none"> <li>- Development of District Development plans</li> </ul>
Resource allocation	<ul style="list-style-type: none"> <li>- Budget framework paper</li> <li>- Development of guidelines for use of Conditional Grants in agricultural sector in local government e.g. Production and marketing grants</li> </ul>	<ul style="list-style-type: none"> <li>- Preparation of District budgets e.g. DBFP conferences</li> </ul>

<p>Programming and Implementation</p>	<ul style="list-style-type: none"> <li>- Public expenditure reviews</li> <li>- Joint Agricultural Sector Annual Reviews</li> <li>- Developing climate smart M&amp;E framework and indicators</li> </ul>	<ul style="list-style-type: none"> <li>- Private sector and civil society processes</li> <li>- developing climate smart M&amp;E framework for district development plans (indicators)</li> </ul>
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At the review stage of agriculture sector policies or plans, climate change screening involves examining the following aspects: -

- the possible vulnerability of the policy/plan to climate risks being addressed;
- the possibility that the policy/plan may lead to increased vulnerability/maladaptation;
- the contribution of the policy/plan may contribute to GHG emissions
- for existing policies and plans subject to reviews, check the amendments that may be required to better address climate risks, constraints and opportunities (**climate proofing**) (OECD, 2009).

Climate change screening results in decisions regarding:

- (i) the need for further studies and investigations of adaptation and mitigation considerations;
- (ii) the need for redesigning the agricultural policy/plan or integrating special adaptation measures.

At the policy formulation stage, mainstreaming climate change requires the following: -

- a clear recognition of climate risks and the need for adaptation or mitigation;
- reflecting upon and deepening action on climate change priorities established at the national level
- applying a ‘climate lens’ to the formulation process, and making the necessary adjustments to policies (OECD, 2009; Olhoff & Schaer, 2010).

At the policy planning stage, mainstreaming climate change requires the following: -

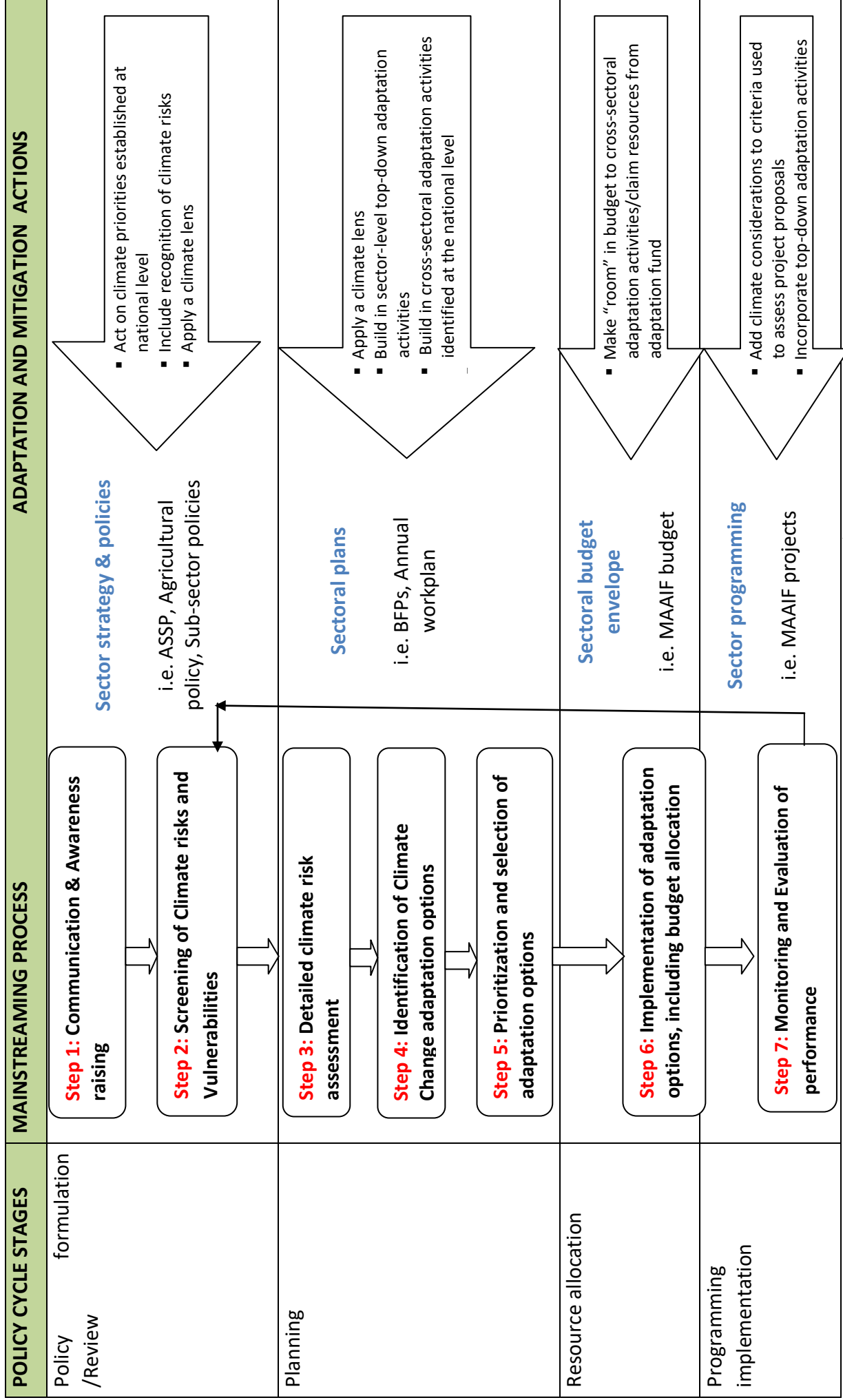
- applying a ‘climate lens’ to the proposed policy/ plan;
- proactively mainstreaming climate change adaptation/mitigation considerations in the policies or plans (including sector-level top-down activities);
- mainstreaming cross-sectoral adaptations/mitigation considerations and measures identified at the national level (e.g. in relation to disaster risk management) (OECD, 2009; Olhoff & Schaer, 2010).

### 3.2 Basic steps for mainstreaming climate change adaptation and mitigation in agricultural sector policies and plans

Mainstreaming climate change adaptation and mitigation is viewed as a continuous process. The basic steps for mainstreaming climate change adaptation and mitigation in the agricultural sector policies and plans are presented in Figure 3 below: -



Figure 2: Basic steps for mainstreaming climate change adaptation and mitigation in the agricultural sector policies and plans



### ***Step 1: Communication & Awareness raising***

In order for climate risks to be recognized in the formulation/reviews of Agriculture Sector plans and policies, there is need to raise awareness among the key stakeholders on the linkages between climate change, vulnerability, impacts and development, and on the relevance, effectiveness, efficiency and overall sustainability of possible responses (UNDP-UNEP 2009 and 2011). Therefore, raising awareness is the first step in the mainstreaming process.

During awareness raising, stakeholders should be informed and convinced about climate change based on the available Uganda-specific evidence of the impact of climate change and the effectiveness of adaptation measures in agriculture sector. This evidence can be obtained from existing scientific studies and reports, as well as day-to-day practical experiences of climate change in agriculture sector in Uganda. The focus should be on the impact of climate change in the past, the current and the future. It should be noted that awareness raising is a continuous process that we be promoted throughout the mainstreaming process and drawing on new emerging information and issues.

### ***Step 2: Screening of Climate Risks and Vulnerabilities (apply a Climate lens)***

Step 2 involves the assessment of climate risks and vulnerability of the agricultural sector policy or plan to determine:

- The vulnerability to climate risks;
- The extent to which climate change risks have been taken into consideration in the formulation stage;
- Whether the policy, regulation or plan could lead to increased vulnerability, i.e. maladaptation, or miss important opportunities arising from climate change; and
- What amendments might be warranted for existing policies, strategies, regulations, or plans in order to address climate risks and/or opportunities

Screening of climate risks and vulnerabilities should make it possible to at once decide whether a policy, plan or programme is at risk from climate change. If this is not the case, no further work needs to be done. However, if the policy, plan or programme is assessed to be at risk, further work is required to identify the extent of the risk, assess climate change impacts and adaptation responses in more detail, and identify possible recommendations/actions.

Screening of climate risks and vulnerabilities should be undertaken considering the various thematic areas of the policy, or plan.

The basic screening framework developed by the FAO Economic and Policy Innovations for Climate Smart Agriculture (EPIC) programme (Branca et al., 2012) is suitable for screening of the agriculture sector policies and plans.

The tool should be used to examine each activity within the MAAIF ASSP and other sectoral policies and plans for their responsiveness to climate change adaptation and contributions to

mitigation measures. Adaptation measures are subdivided into slow-onset and extreme events, with slow-onset further sub-divided into increases in physical, economic and social resilience. Contributions to mitigation are also further subdivided into those leading to carbon sequestration, greenhouse gas (GHG) emission reductions and reduced GHG emissions per unit of productive output (increased efficiency).

A tool for climate smart adaptation screening of agriculture sector policies and plans is presented in **Appendix 3**.

### ***Step 3: Detailed Climate Risk Assessment***

Step 3 involves carrying out detailed climate change risk assessment of agriculture sector policies and plans. **Strategic Environmental Assessment (SEA)** is one of the best available tools for supporting detailed climate change risk assessment of sector policies, plans and programmes (OECD, 2008, OECD, 2009). SEA is a study aimed at analysing the environmental consequences of a proposed policy, plan or programme, as well as the main the opportunities, risks and constraints to be taken into account for the purpose of promoting more sustainable development. It helps ensure that environmental considerations are taken into account, alongside social and economic ones, early in the policy and planning process (Partidário, 2007; EC, 2009).

SEA should ideally be prepared either as an integral component of the policy-making or planning process, or in parallel to it. However, SEA often occurs once the draft policy, plan or programme is ready although this situation is not ideal as there is a more limited scope to influence the policy, plan or programme contents.

A **model of Terms of Reference for a SEA** supporting the mainstreaming of climate-related aspects is provided in **Appendix 4**.

In order to determine if it would be worth carrying out an SEA for a policy, plan or programme, an SEA screening should be conducted. SEA screening normally consists of a 'positive list' (i.e. a list of policy, plan or programme for which SEA is always recommended), complemented by a questionnaire that allows reflection on the degree of environmental sensitivity associated to the plan, policy or programme in question. Even if the SEA screening indicates that a SEA is not required, the screening process itself will always be useful to identify areas of attention that should be integrated in the policy-making or planning process. A **Questionnaire for strategic environmental assessment (SEA) screening** is in Appendix 5.

#### ***Step 4: Identification of Climate Change adaptation options***

The aim of step 4 is to identify adaptation options for modifying the policy, plan or programme in response to risks and vulnerabilities identified in step 3. This step involves compiling an initial list of adaptation options, and holding stakeholder meetings to discuss and finalize the list of adaptation options. The process of compiling a list of adaptation options is divided into preparatory and participatory activities.

Preparatory activities involve the following: -

- reviewing and extracting information on climate impacts and
- reviewing of previous and current projects to determine adaptation options identified, assessed or implemented;
- reviewing reports prepared by climate change experts to provide credible data and information and
- reviewing strategies and policies on climate change adaptation.

Participatory activities include:

- Holding meetings and workshops with stakeholders to discuss climate change impacts and adaptation options,
- Consulting with national and international climate change experts on climate change adaptation to review the list and identify gaps in the list,
- Assisting stakeholders in developing information on options to conduct the screening exercise.
- Grouping options by activity type and characterizing them either as substitutes or complements to other adaptation options, or bundling them into adaptation strategies
- Eliminating options that are not technically or technologically feasible to implement in the project or program at the present time.
- Facilitating a selection process to allow stakeholders to finalize the adaptations list.

A number of options are available for mainstreaming climate change adaptation and mitigation in agriculture sector policies and plans (**Appendix 6**).

#### ***Step 5: Prioritization and selection of adaptation options***

Mainstreaming climate change in policies, plans and strategies leads to the identification of a range of policy options for climate change adaptation and mitigation. These options and measures should be subjected to analytical process where decisions are made to select the most appropriate options in terms of effectiveness, technical and economic feasibility and other criteria (Table 4). These adaptation options may include existing or new interventions/options. Each option should be thoroughly analyzed and those that are likely to provide the best results in terms of reducing the climate change burden, are selected and implemented.

It should be noted that climate change has unintended impacts across borders; and therefore the options considered should not be bound by administrative boundaries.

**Table 4: Key Evaluation Criteria for use when selecting Adaptation Options**

<b>Criterion</b>	<b>Description</b>
<i>Cost</i>	Costs to implement adaptation options
<i>Efficiency</i>	Are the outputs achieved optimal relative to the resources allocated?
<i>Effectiveness</i>	Capacity to solve problems or realize opportunities derived from climate change impacts (e.g., economic benefits, costs avoided, lives saved)
<i>Ease of implementation</i>	Includes issues such as barriers to implementation and the need to adjust other policies to accommodate the adaptation option
<i>Acceptability to local stakeholders</i>	All identified possible adaptations are attractive to some stakeholders, but may not be equally acceptable or attractive to all stakeholders for political, economic, social or cultural reasons
<i>Acceptability to Financing Agencies/ Donors</i>	Any options that financing agencies/ministries are unwilling to support should be identified and the reasons communicated to stakeholders
<i>Endorsement by Experts</i>	The option should be consistent with international best practices
<i>Timeframe</i>	The timeframe needed to implement the adaptation options
<i>Institutional Capacity</i>	How much additional capacity building and knowledge transfer is required for the adaptation option to be implemented
<i>Size of Beneficiaries Group</i>	Adaptations that provide small benefits to large numbers of people will often be favoured over those that provide larger benefits, but to fewer people
<i>Adequacy for current climate</i>	Are there negative consequences of the adaptation option in the current climate? Some adaptations may be targeted at the future climate but have costs and consequences under the current climate
<i>Potential Environmental or Social Impacts</i>	Are there possible adverse impacts on the environment or people (e.g., are additional GHG emissions likely)?
<i>Capacity to be sustained over time</i>	Can the adaptation option be successfully sustained at local, district or national level if implemented?
<i>Gender sensitiveness</i>	How does the proposed intervention affect the roles of women, men, youths and PWDs? Does it advantage any group at the expense of another? Does it take into consideration the aspirations of different groups?
<i>Participation</i>	Have the community members participated in identifying and selecting the proposed option?

Modified from UNDP (2010)

The tool for prioritizing and selecting adaptation and mitigation options is the **Multi-Criteria Analysis (MCA)** presented in Table 5.

The MCA is an approach that uses more than one criterion to analyse performance and rank various adaptation options or interventions.

One of the advantages of MCA is that it allows stakeholder participation (Niang-Dop & Bosch 2004). MCA typically uses less data- and resources and it may be used in situations of resource constraints.

In conducting the analysis of adaptation options, the following issues should be given consideration:

- For each proposed adaptation option, it should be evaluated on a pre-determined scale that is appropriate for the option. For example, factors such as cost, or expert’s endorsement can be rated in qualitative terms as low (1), medium (2), high (3), or very high (4). Where numerical scores are used, they can be added up to calculate a total score (with the possibility of applying different weights to different criteria) (EC 2003, Niang-Dop & Bosch 2004). The adaptation option with the **highest score** is selected.
- It is important to organize the results of adaptation analysis in a matrix form to facilitate comparison and selection of adaptation options. This approach is good because it is effective and less costly.
- GHG emissions with implications of the potential adaption options should be considered to ensure that climate change is not exacerbated by the activity. For example, building a reservoir could increase carbon emissions as flooded trees decay and release carbon.

The output of step 4 is a **Multi-criteria Analysis matrix** (Table 5).

**Table 5: Multi-criteria Analysis (MCA) Matrix**

Adaptation Option	Effective-ness	Cost or CBR <sup>(*)</sup>	Technical feasibility	Social & cultural acceptability	Speed	Total score
Option 1						
Option 2						
Option 3						
Option 4						

(\*) CBR = cost-benefit ratio  
 Scores: From 1 (poorest performance) to 4 (highest performance). As far as cost is concerned, a scale should be established, with scores corresponding to a given cost range or cost/unit range.

Adapted from: USAID (2007) *Adapting to Climate Variability and Change: A guidance manual for development planning*. Exhibit 12, p. 18.

### ***Step 6: Implementation of adaptation options, including budget allocations***

The implementation of the selected, prioritized adaptation options depends on budget allocations. At the agricultural sector level, budget allocations for adaptation will depend critically on the cases or arguments for action that result from the detailed assessments of costs and benefits of climate change adaptation activities.

In addition, results and experience from adaptation activities at the project level can provide valuable arguments for allocating scarce resources to climate change adaptation.

The implementation of selected adaptation options will require developing an implementation plan for mainstreaming climate change in the agricultural sector. The implementation plan also serves as a tool for allocating resources for mainstreaming in time and space. The plan should include details of the key stakeholders, their roles and responsibilities and should set timelines for specific outputs.

The implementation plan for mainstreaming climate change adaptation in agricultural sector should include the following components:

- *Strategic plan outlining actions and timelines of involved stakeholders;*
- *Capacity building needs assessment and training plan;*
- *Budget covering expenditure needs and revenue sources;*
- *Outreach / communication plan;*
- *Exit/Sustainability plan (a key document to ensure continuity of implementation activities, capacity building and M&E);*
- *Plan for monitoring the performance of adaptations.*

Though mainstreaming climate change adaptation is a continuous process, the implementation plan should set specific time-bound milestones for the major tasks, time frame for delivery and lead responsible persons for the implementation. Table 6 provides examples of the key milestones, the estimated time frame for implementation and responsible persons responsible for mainstreaming climate change adaptation in agricultural sector.

To guide and harmonize the implementation processes and create room for synergies in different sub-sectors, this guideline proposes an outline for implementation plans for mainstreaming climate change. The implementation plans should be based on the climate change impact and vulnerability assessment.

The implementation plan for mainstreaming climate change adaptation should stipulate the roles and responsibilities of the different stakeholders. **Table 6** highlights the key institutions and their roles and responsibilities in mainstreaming of climate change in agricultural sector plans and budgets.

**Table 6: Key milestones and Institutional responsibilities for mainstreaming climate change in agricultural sector**

	Key Task/Milestone	Time frame	Responsible Lead Institution
1	Raise awareness on climate issues among policy makers in the central and local governments and implementers and the community level	24 months	CCD, MoLG, Districts, Media, CSOs, Academia
2	Conduct detailed Climate Change Assessment for agricultural sector	6 months	MAAIF Task Force on Climate Change, CCD, NARO
3	Identify & Analyse Adaptation Actions	3 months	MAAIF Task Force on Climate Change, CCD,
4	Design costed Programmes for CC Adaptation and mitigation	2 months	MAAIF Task Force on Climate Change, CCD,
5	Design the Adaptation Plan and mainstreaming Agenda	2 months	MAAIF Task Force on Climate Change, CCD,
6	Mobilise funds for mainstreaming CC Adaptation and implementation	12 months	MOFPED, Development Partners, Districts, Local communities
7	Train different relevant sector actors on climate change adaptation and mitigation at all levels	18 months	CCD, MOLG, MAAIF Task Force on Climate Change, CCD, Districts, Academia
8	Develop District and Community level adaptation and mitigation Plans	12 months	CCD, MOLG, MAAIF Climate Change Task Force, Districts
9	Design pilot adaptation and mitigation actions at all levels	18 months	MOLG, MAAIF agencies, MAAIF Climate Change Task Force, Districts
10	Implement different sub-Sector CC adaptation and mitigation plans	60 months	MAAIF Climate Change Task Force Districts, CCD, Local communities
11	Monitor the mainstreaming process for CC adaptation and mitigation	48 months	CCD, MOLG, MAAIF Climate Change Task Force
12	Evaluate performance and review the adaptation and mitigation process	48 months	CCD, MOLG, MAAIF Climate Change Task Force, Districts
13	Include climate related gender dimensions in all sub-sectors	12 months	MoGLSD, MoLG, MAAIF sub-sectors

### ***Step 7: Monitoring and Evaluation of the Adaptation and Mitigation Process***

One of the most important steps during the mainstreaming of climate change in agricultural sector plans and budgets is to verify whether the implemented adaptation and mitigation options have helped to climate-proof the agricultural sector. This is accomplished through regular monitoring of the interventions and subjecting the different systems to a climate change check at regular



Mainstreaming Climate Change Adaptation and Mitigation in the Agriculture Sector Policies & Plans  
 intervals. The monitoring should be carried out as part of other existing M&E system of MAAIF and its Agencies. However, specific climate change adaptation and mitigation indicators should be developed and integrated at MAAIF M&E and local community levels. Such an action should ensure that Agricultural Sector Reviews should pin point progress made to adapt to climate change and the extent to which climate change is affecting different outcomes. Monitoring of the adaptation process must be iterative, where the results will be used to inform a review or refining of the initial adaptation strategy or specific components. Results of the monitoring and evaluation should be used to feed into the national performance monitoring framework (PMF) coordinated by CCD.

This step should aim at having climate change reflected in sector level policy objectives and statements, as well as sector work plans and budgets. Climate change should also be considered as one minimum sector performance standards that are monitored annually. In context of climate change, a number of aspects require monitoring. Table 7 summarizes the aspects to be monitored and the rationale of monitoring them.

**Table 7: Climate change mainstreaming: Aspects to monitor**

Aspects to monitor	Rationale for monitoring
Climate variability and change, impacts and vulnerabilities	<ul style="list-style-type: none"> <li>- Make decisions as well informed as possible</li> <li>- Support adaptive management</li> </ul>
Policy and institutional change	<ul style="list-style-type: none"> <li>- Enhance the transparency and accountability of the mainstreaming process</li> <li>- Promote the institutionalization of climate change mainstreaming</li> </ul>
Policy implementation and outcomes	<ul style="list-style-type: none"> <li>- Ensure commitment to the objectives set in policies and strategies</li> <li>- Stimulate the achievement of tangible outcomes</li> </ul>

Monitoring climate change should focus on the three aspects in Table 7 above. The aspects should be integrated in the M&E system of MAAIF. Indicators and milestones related to climate change mainstreaming processes and associated response can thus be included in the performance assessments or logical frameworks of the MAAIF-ASSP, district development plans and individual projects (OECD, 2009; UNDP-UNEP, 2011). Examples of indicators related to these aspects are provided in **Appendix 7**.

An M&E plan should be put in place to follow up on the success of the mainstreaming process. The monitoring and evaluation would be best carried out by the M&E division in MAAIF, in relation to the monitoring of implementation for the MAAIF-ASSP. The M&E system should make use of climate data and develop an analytical framework, with inputs from sub-sectors. Performance targets, monitoring and reporting schedules and data collection systems, must include key climate change information and its links to the sub sector outcomes, as stipulated in the MAAIF-ASSP.

The M&E division in MAAIF should share information on how the sub-sectors are addressing climate change. This requires investment in data and research, which is already a key objective within the MAAIF-ASSP. For effective monitoring, strong partnership will also be needed to link

Mainstreaming Climate Change Adaptation and Mitigation in the Agriculture Sector Policies & Plans with climate related institutions such as the Climate Change Department (CCD) of the Ministry of Water and Environment as well as MoFPED, MoLG, Office of the Prime Minister (OPM) and District Local Governments. There is also need to package and disseminate information to target local communities. Fostering cooperation between MAAIF and the Uganda National Meteorological Authority (UNMA) is essential for the development of tools for assessing current and future impacts, vulnerabilities and risks. For instance, early warning and longer-range forecasting systems (for events such as droughts, floods, storms, famine, disease epidemics, pest outbreaks) signal the possible occurrence of disasters and epidemics with a lead time of a few days, weeks or months, thus supporting improved responsiveness to a variety of climate-sensitive emergencies.

Results from the monitoring of climate change mainstreaming and related information should be widely shared using platforms such as the Joint Sector Reviews. The monitoring and evaluation should aim at capturing lessons learnt during the mainstreaming process to be used during planning and budgeting sessions.

## APPENDICES

### Appendix 1: Definition of key terms in climate change adaptation and mitigation

**Adaptation to climate change:** Actions or adjustments intended to improve the resilience of agriculture, enhance its capacity to deal with conditions associated with climate change, and hence reduce the vulnerability of agriculture to changing climate

**Adaptive capacity:** The ability of a system, individual or group to adjust to climate change (including climate variability and change), through the adoption of risk prevention and mitigation measures.

**Carbon sequestration:** The incorporation of carbon dioxide into permanent plant tissues

**Climate:** The average characteristics of meteorological conditions, calculated over a long period (typically 30 years or more).

**Climate change:** Any change in climate over time, whether due to natural variability or as a result of human activity.

**Climate lens:** An analytical tool to examine a strategy, policy, plan or policy measure (e.g. law and regulation). It involves examining the extent to which a strategy, policy, plan or policy measure under consideration could be vulnerable to risks arising from climate change; the extent to which climate risks have been taken into consideration in the course of the formulation of the strategy, policy, plan or policy measure; the extent to which it could increase vulnerability, leading to maladaptation (e.g. for certain population groups, regions or sectors); and what amendments might be warranted to address climate risks.

**Climate proofing:** Actions taken to protect infrastructure, systems and processes against projected climate impacts for a period into the future, i.e. over their entire lifetime

**Climate variability:** Range of variation in climate parameters, characterised by the difference between observed values and average values calculated at various temporal scales. Current climate variability typically refers to variability observed over periods shorter than 10 years.

**Exposure to climate change:** The extent to which a person, a group, a system is exposed to the physical manifestations of climate change, considering that their character, magnitude and likelihood and the rate of variation of climate will vary in nature and intensity across regions of the world.

**Greenhouse effect:** The result of certain gases in the atmosphere (so-called greenhouse gases) absorbing energy that is radiated from the Earth's surface, and so warming the atmosphere.

**Greenhouse gas:** Any gas that traps energy radiated by the Earth, including (but not limited to) water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), and ozone (O<sub>3</sub>).

**Hazard:** a potentially damaging physical event, action, situation or phenomenon; a *climate hazard* is a manifestation of climate variability or change, or a specific type of climate event (discrete or continuous, one-off or recurrent), holding the potential to cause harm.

**Impacts of Climate change:** consequences of *climate change* on natural and *human systems*. Depending on the consideration of *adaptation*, one can distinguish between potential impacts and residual impacts. **Potential impacts:** All impacts that may occur given a projected change in climate, without considering adaptation. **Residual impacts:** The impacts of climate change that would occur after adaptation.

**Institutions:** The rules, norms, structures and other social arrangements that shape and regulate human behaviour and interactions, and notably support decision making.

**Mainstreaming Climate change:** This is the integration of climate concerns and adaptation responses into relevant policies, plans, programs, and projects at the national, sub-national, and local scales.

**Maladaptation:** Occurs when an action or process increases vulnerability to climate change-related hazards. Maladaptive actions and processes often include planned development policies and measures that deliver short-term gains or economic benefits, but can eventually lead to exacerbated vulnerability in the medium to long term.

**Mitigation:** Activities which seek to reduce the human effects on global warming by reducing the quantity of greenhouse gases released to the atmosphere.

**Resilience:** The ability of a system, individual or group to resist, absorb, and recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity.

**Risk:** the likelihood of loss associated with exposure to a climate-related hazard. Risk is generally measured as a combination of the probability of an event, its likelihood and its consequences, i.e., risk equals the probability of climate hazard multiplied by a given system's vulnerability.

**Sensitivity:** The degree to which an individual or system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g. damages caused by an increase in the frequency of draughts). Sensitivity includes exposure that considers the nature and magnitude of climate change and whether a system would be affected by such change.

**Sequestration:** The process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through land-use change, afforestation, reforestation and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from fuel gases and long-term storage underground.

**Sink:** Any process, activity or mechanism that removes a greenhouse gas from the atmosphere.

**Vulnerability:** The degree to which a system, individual or group is susceptible to, and unable to cope with, adverse effects of climate variability and change. Vulnerability depends on *exposure* to climate variability and change, *sensitivity* to their effects and *adaptive capacity*.

### Appendix 2: Impacts of Climate hazards on Agriculture Sector

Hazard	Impacts		
	Crop Sub-sector	Livestock Sub-sector	Fisheries Sub-sector
Drought	<ul style="list-style-type: none"> <li>• Crop failure</li> <li>• Reduced yields</li> <li>• Increased incidences of crop pests</li> <li>• Reduced soil fertility, soil erosion, moisture, texture</li> <li>• Famine</li> <li>• Decline in water table</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced productivity and quality for milk and meat due to shortage of water and pasture</li> <li>• Reduction in production and productivity of animals due to heat stress</li> <li>• High incidences of diseases, parasites and vectors e.g. anthrax, ticks and parasites such as fleas</li> <li>• Emerging and re-emerging of livestock diseases</li> <li>• Livestock migration in search of water and pasture</li> <li>• Increase in conflicts over pasture and water</li> <li>• Food insecurity among farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced fish catches due to reduced water exposing breeding grounds which affects breeding of fish for the subsequent season</li> <li>• Reduced reproduction due to stress, migrations and hibernation</li> <li>• Receded water level leads to reduced quality and quantity of fish due to reduced food availability, reduced species adapt differently to the changing conditions;</li> <li>• Increased cost of production due to scarce feed resources</li> <li>• In aquaculture, drought leads to drying of ponds (lowering of water levels making it difficult for fish survive)</li> <li>• Increased temperatures affect reproduction high temp affects the oxygen quantity in the water which leads to frequent fish kills (due to up waling, reduced food phytoplankton due to less nitrification of water)</li> </ul>
Floods and Water logging	<ul style="list-style-type: none"> <li>• Rotting of root crops.</li> <li>• Suffocation and stunting of crops.</li> <li>• Destruction of crops through submerging.</li> <li>• Increased incidences of crop diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in vectors (ticks) &amp; diseases,</li> <li>• destruction of physical infrastructure (roads, bridges) which impedes movements to markets</li> <li>• submerging and</li> </ul>	<p><b>Low capture of fish due to</b></p> <ul style="list-style-type: none"> <li>• Silting and pollution that cause fish deaths</li> <li>• Habitat loss due to silting</li> <li>• Loss of water oxygen</li> <li>• Increased proliferation n of weeds</li> <li>• Destruction of fisheries infrastructure e.g. cages</li> <li>• Capsizing of boats and loss of lives</li> </ul>

Mainstreaming Climate Change Adaptation and Mitigation in the Agriculture Sector Policies & Plans

	Kyoga	<ul style="list-style-type: none"> <li>Reduced arable land for crop production</li> <li>Reduced soil fertility due to leaching, soil erosion</li> <li>Increased pre- and post-harvest losses</li> <li>Food insecurity</li> </ul>	<ul style="list-style-type: none"> <li>Death of animals and reduction in grazing land,</li> <li>Destruction of animal water reservoirs</li> <li>Destruction of physical infrastructure which undermines marketing and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Increased incidences of zoonotic diseases</li> </ul> <p><b>Aquaculture</b></p> <ul style="list-style-type: none"> <li>Loss of fish in floods</li> <li>Water quality is affected</li> <li>Loss of water oxygen</li> </ul>
Land Slides / Mud slides / Rock slides	High land areas of Mount Elgon, Bundibugyo and Kigezi	<ul style="list-style-type: none"> <li>Destruction of the farming systems</li> <li>Destruction of the soil profile</li> <li>Death of crops</li> <li>Loss of people ( production labour)</li> <li>Food security challenge</li> <li>Interference of transportation of food items to markets</li> </ul>	<ul style="list-style-type: none"> <li>Death of animals and reduction in grazing land,</li> <li>Destruction of animal water reservoirs</li> <li>Destruction of physical infrastructure which undermines marketing and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Cause silting of lakes and ponds resulting in fish deaths and migrations</li> <li>Loss of fish habitat</li> </ul>
Pests and Diseases	All areas	<ul style="list-style-type: none"> <li>Poor yields</li> <li>Low yields</li> <li>Reduced nutrient value</li> <li>Poverty</li> <li>Malnutrition</li> <li>Food insecurity</li> <li>Reduces crop ranges</li> </ul>	<ul style="list-style-type: none"> <li>Death of livestock,</li> <li>Reduction in productivity, Reduction in quantity and quality of the pastures</li> <li>Loss of revenue</li> </ul>	<ul style="list-style-type: none"> <li>Death of fish species</li> <li>reduced fish reproduction low fish captures</li> </ul>
Storms and Winds	All areas	<ul style="list-style-type: none"> <li>Destroy farming systems</li> <li>Interferes with transport system</li> <li>Destroys storage structures</li> <li>Kills people (reduces farming labour)</li> </ul>	Minimal impacts	<ul style="list-style-type: none"> <li>Fish migrations and deaths</li> <li>Poor water quality</li> <li>Capsizing of boats</li> </ul>
Lightening	All areas	<ul style="list-style-type: none"> <li>Kills people (reduces farming labour)</li> </ul>	<ul style="list-style-type: none"> <li>Death of animals</li> </ul>	Minimal impacts

### Appendix 3: Examples of Climate Change Adaptation and Mitigation measures in Agriculture sub-Sectors

Sub-Sector	Adaptation measures	Mitigation measures
Crop	<ul style="list-style-type: none"> <li>• Adoption of drought tolerant crop varieties</li> <li>• Adoption of water storage and irrigation measures</li> <li>• Diversification and enterprise mix</li> <li>• Development of early maturing varieties (maize, beans, cassava, soybeans and potatoes) that give high yield, resistant to drought, pests and diseases;</li> <li>• Put in place post-harvest handling and value addition technologies</li> <li>• Use of highly fortified crops for nutrition improvement i.e potatoes bio-fortified with vitamin A</li> <li>• Use of climate SMART technologies</li> <li>• Integrated pest and disease management practices</li> <li>• Improved phytosanitary measures such as use of clean planting materials, disinfection of farm inputs</li> <li>• Investment in early warning systems and seasonal forecasts;</li> <li>• Promotion of improved farming technologies e.g. irrigation, use of fertilizers and change in sowing dates;</li> <li>• adjustment of planting dates (timely planting)</li> <li>• improved land management, e.g. erosion control and soil protection through tree planting</li> <li>• Introduction of vegetable gardens at the household level.</li> </ul>	<p>Three categories of mitigation measures:</p> <p><b>Carbon sequestration</b></p> <ul style="list-style-type: none"> <li>• Conservation agriculture practices</li> <li>• Promote agro-forestry interventions</li> <li>• Increased above and below-ground woody biomass;</li> <li>• Increased soil organic matter content</li> </ul> <p><b>GHG emission reduction</b></p> <ul style="list-style-type: none"> <li>• Use of renewable fuels</li> <li>• Re-use/recycling of materials</li> <li>• Adoption of energy technologies</li> <li>• Reductions in wildfires/crop residue burning, etc. through enforcement of bylaws and ordinances</li> <li>• Appropriate use of fertilizers to reduce on methane emissions</li> <li>• Sustainable use of wetlands in rice growing</li> <li>• Growing of cover crops (increases plant nitrogen uptake and decreases accumulation of nitrate, and thus reduces soil N<sub>2</sub>O emissions)</li> </ul> <p><b>GHG emission efficiency</b></p> <ul style="list-style-type: none"> <li>• Increased crop/animal productivity per unit of emission output through improved timing of input usage, loss reduction, etc.</li> </ul>

<p>Livestock</p>	<ul style="list-style-type: none"> <li>• Preservation of feed stuffs (such as making hay and silage),</li> <li>• Provision of concentrates /supplementary feeds,</li> <li>• Adopt drought resistant species of pasture &amp; fodder crops,</li> <li>• Water use efficiency</li> <li>• Destocking in dry seasons,</li> <li>• Good husbandry practices like zero grazing.</li> <li>• Integrated vector management,</li> <li>• Integrated pasture management including tree planting (fodder trees) and pasture improvement, dry season feeding technologies.</li> <li>• Diversify livestock types and varieties</li> <li>• Promote proper pasture management through rotational grazing</li> <li>• Selection of faster growing livestock breeds</li> <li>• Promote improved animal manure storage</li> <li>• Impose quarantines, vaccination, resistant breeds</li> <li>• Plant multipurpose trees</li> <li>• Avoid grazing animals on slopes.</li> <li>• Integrated pest management.</li> <li>• Extend veterinary services / vaccination</li> <li>• Good husbandry practices (sanitation, nutrition)</li> <li>• Vector and Disease surveillance</li> <li>• Adoption of improved breeds to increase productivity while reducing CH<sub>4</sub> emission</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate waste/manure management, e.g. reducing the time of manure storage, aeration, and stacking generally decrease the time allowed for microbial fermentation processes to occur before land application.</li> <li>• Timing of manure application (e.g. to match crop nutrient demands, avoiding application before rain) and maintaining soil pH above 6.5 may also effectively decrease N<sub>2</sub>O emissions.</li> <li>• Production of biogas</li> <li>• Cross-breeding local cattle with exotic to improve on feed conversion ratio and reduce on methane gas emissions.</li> <li>• Improved animal nutrition e.g. feeding protein close to animal requirements, including varying dietary protein concentration with stage of lactation or growth,</li> <li>• Planting of fodder crops.</li> <li>• Improved management of pastures and grazing practices on natural grasslands, including by optimizing stock numbers and rotational grazing;</li> <li>• Harvesting forage in the afternoon when its sugar content is higher may reduce urinary nitrogen excretion, ammonia volatilization and perhaps N<sub>2</sub>O emission from manure applied to soil</li> <li>• Application of Urease and nitrification inhibitors are promising options to reduce N<sub>2</sub>O emissions from intensive livestock production systems (although costly to apply)</li> <li>• Increasing animal productivity can be a very effective strategy for reducing GHG emissions per unit of livestock product. For example, improving the genetic potential of animals through planned cross-breeding or selection</li> </ul>
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		<p>within breeds, and achieving this genetic potential through proper nutrition and improvements in reproductive efficiency, animal health and reproductive lifespan are effective and recommended approaches for improving animal productivity and reducing GHG emission intensity.</p> <ul style="list-style-type: none"> <li>• Reduction of herd size would increase feed availability and productivity of individual animals and the total herd, thus lowering CH4 emission intensity.</li> <li>• Reducing age at slaughter of cattle</li> <li>• Improved animal health and reduced mortality and morbidity are expected to increase herd productivity and reduce GHG emission</li> <li>• Adoption of artificial insemination so that fewer males are required</li> </ul>
<p>Fisheries</p>	<ul style="list-style-type: none"> <li>• Enforce regulations on water safety such as use of motorized boats and life jackets</li> <li>• Enforce laws on pollution to restrict human activities such as use of chemicals in farming, settlement, industries around water bodies that pollute water bodies.</li> <li>• Establish infrastructure on lakes to take care of fluctuating lake levels e.g., piers and floating Jetties.</li> <li>• Proper siting of fish ponds to consider flooding from the water source. Ponds should be constructed on slopes and higher ground. Plant vegetation on the banks of fish ponds to protect the fish from floods during heavy rains.</li> </ul>	<ul style="list-style-type: none"> <li>• Proper feeding of fish</li> </ul>

## Appendix 4: Tool for Climate Smart Adaptation Screening of Agriculture sector policies and plans

The tool for screening of the Agriculture sector strategic plan (ASSP) and policies utilizes the basic screening framework developed by the FAO Economic and Policy Innovations for Climate smart agriculture (EPIC) programme (Branca et al., 2012)<sup>1</sup>. The tool is used to examine each activity within the plans and policies for responsiveness to climate change adaptation and contributions to mitigation measures. Adaptation measures are subdivided into slow-onset and extreme events, with slow-onset further subdivided into increases in physical, economic and social resilience, i.e. household's adaptation measures to vulnerability in terms of physical, financial, human and social capital resilience. Contributions to mitigation are also further subdivided into those leading to carbon sequestration, greenhouse gas (GHG) emission reductions and reduced GHG emissions per unit of productive output (increased efficiency). The tool is indicated below:

Climate Smart Screening Measures		Example of Climate Smart Responsive Actions
Adaptation	Physical resilience	e.g., development and promotion of drought and/or heat tolerant crop varieties/animal/fish breeds; enhanced water control and storage capacity, cold chain infrastructure, etc.
	Economic resilience	e.g., increased economic welfare and individual savings; advocate crop insurance schemes; village warehouse receipts facilities, bulking facility, etc.
	Human-social resilience	e.g., increased individual knowledge of climate change impacts; strengthened local resource management capacities; etc.
Extreme Events		e.g., early warning systems; national disaster response preparedness; crop gene bank and robust seed system, etc.
Mitigation	Carbon sequestration	Increased above and below-ground woody biomass; increased soil organic matter content.
	GHG emission reduction	Reduction in point-source emissions, e.g., use of renewable fuels, re-use/recycling of materials, reductions in wildfires/crop residue burning, etc.
	GHG emission efficiency	Increased crop/animal productivity per unit of emission output through improved timing of input usage, more complete animal nutrition, loss reduction, etc.

The screening is realized at programme/sub-programme level, i.e. activities, costs (and physical targets) are reported by programme/sub-programme. A matrix is developed with all the programmes/sub-programmes of the ASSP, listing the activities foreseen in each

<sup>1</sup> Branca, G., Tennigkeit, T., Mann, W. and L. Lipper. 2012. Identifying Opportunities for Climate-smart Agriculture Investments in Africa. Rome: Food and Agriculture Organization of the United Nations.

programme/subprogramme. The matrix built as described above is used to perform a set test on the climate-smartness of the ASSP.

This test is based on estimating the contribution of programmes/sub-programmes to adaptation and mitigation. The test consists of identifying the potential adaptation (slow onset and extreme events) and mitigation (absolute GHG reduction, C sequestration, and GHG reduction through increased production efficiency) contribution of each programme/sub-programme of the investment plans.

The test is conducted on the basis of the general international consensus of the impacts of various agricultural activities on adaptation and mitigation, based on available literature and analytical framework for CSA.

The matrix highlights if the programmes/activities potentially contribute to climate change adaptation (slow onset and extreme events) and how, indicating which dimension of systems' resilience will be increased or which mitigation mechanism is involved (GHG reduction, carbon sequestration, efficiency increase).

Each programme/sub-programme is screened taking into account the activities planned and checking if they are contributing to adaptation and/or mitigation. Resulting scores are then synthesized through an index representing the total climate benefits potentially gained as a result of the implementation of the ASSP activities, expressed as a percentage of the total number of programme/sub-programmes (for ease of computation of the index we assume that 1 percent = 1).

The plans are also screened in order to verify if there are programmes/sub-programmes with explicit adaptation and/or mitigation goals factored in, or if the plan has identified climate variability and change as a problem, either explicitly/directly or indirectly (e.g. increased water shortages; increased land degradation; increased pest and diseases which may be caused by climate change), but only in a qualitative way. The analysis is completed by suggesting elements which could make the programmes/sub-programmes more climate-smart (and explaining the rationale).

Example of matrix:

ASSP Priority 1: Enhance Agricultural Production and Productivity								
Strategic Action	Activity	Contribution to Climate Resilience (Adaptation)				Contribution to Mitigation		
		Physical Resilience	Economic Resilience	Human and Social Resilience	Extreme Events	Carbon Sequestration	Green House Gas Emission Reduction	GHG Emission Reduction through production efficiency

## Appendix 5: Terms of Reference for a Strategic Environmental Assessment (SEA) addressing Climate related aspects

**Note:** The model Terms of Reference (ToR) provided here are intended for SEAs undertaken in connection with the formulation of a national or sector policy, strategy or programme. Most elements of these ToR will also be relevant for an SEA undertaken during the review and implementation of a policy, strategy or programme.

### 1. BACKGROUND

A Strategic Environmental Assessment (SEA) is required [for the preparation] [in support of the implementation] of *(title of the policy/strategy/programme)*.

The major documents to consider are *(mention the main documents and their status or stage of preparation)*.

*(Mention other pertinent background information, such as key stakeholders, legal requirements, existing Country Environmental Profile or equivalent document)*.

*(Mention any policy, strategy or programme alternatives to be assessed; if no alternatives have been defined, state this as well)*.

*(Explain the reasons why an SEA is required and which decisions it might influence)*.

### 2. OBJECTIVES

The objective of this SEA is to identify, describe and assess:

- the likely significant effects on the environment of implementing *(title of the policy/strategy/programme)*;
- as well as the most important environmental and natural resource-related constraints bearing on the implementation of this [policy] [strategy] [programme];

to be taken into account in its preparation, review or implementation. The SEA will provide decision makers with relevant information to assess environmental challenges and other considerations (including climate-related ones) with regard to *(title of the policy/strategy/programme)*. This information should help to ensure that environmental and climate-related concerns are appropriately integrated in the decision-making and implementation processes.

### 3. EXPECTED RESULTS

The assessment will be conducted in two phases:

- A *scoping study* will first be undertaken to determine the exact scope and priorities of the strategic environmental assessment and adjust the methodology, on the basis of a preliminary review of available information and initial stakeholder consultation, and taking account of the time and resources available for the entire exercise.

- The ‘core study’ will then be undertaken in accordance with the results of the scoping study, as approved by and agreed with the contracting authority.

### **3.1 Scoping study**

The SEA scoping study will provide:

- A brief description of the considered [policy] [strategy] [programme] and its alternatives.
- A brief description of the relevant institutional and legislative framework (including the policy-making and/or planning process that this SEA is expected to inform).
- A brief presentation of the environmental policies, objectives, standards and regulations relevant to the considered [policy] [strategy] [programme].
- An identification of the key stakeholders and their concerns. Key stakeholders may include national and/or sector authorities, environmental agencies, non-governmental organisations, representatives of the public, and in general groups potentially affected by the likely environmental impacts of implementing the considered [policy] [strategy] [programme].
- An identification of the key interactions between the considered [policy] [strategy] [programme] and the environment (including climate-related aspects).
- A description of the scope of the environmental baseline to be prepared, including (*as far as this aspect is relevant*) the geographical units to be considered.
- A description of the impact identification and evaluation methodologies to be used in the SEA study.
- A stakeholder engagement strategy.
- An indication of the time frame and resources needed to carry out the SEA core study.

*[An indication of the maximum budget available for the SEA can be given here to support ‘realistic’ scoping work.]*

### **3.2 SEA core study**

The SEA core study will deliver the following:

- An environmental baseline, i.e. a description of the current state of the environment (focused on key environmental components identified by the scoping study), environmental pressures and environmental trends under the assumption of no implementation of the considered [policy] [strategy] [programme] or ‘business-as-usual’ development, taking into account the expected effects of climate change.
- The identification and evaluation of environment-related risks, constraints and opportunities – including climate- and natural resource-related aspects – which could affect (positively or negatively) the relevance, effectiveness, efficiency and/or sustainability of the considered [policy] [strategy] [programme]. [This should be done for each alternative being studied.]
- The identification and evaluation of the (positive and negative) impacts the considered [policy] [strategy] [programme] could have on the environment – including the positive or negative contribution to greenhouse gas emissions (if significant relative to national emission levels). [This should be done for each alternative being studied.] The significance of impacts should be assessed taking into account their characteristics, the views and concerns of stakeholders and the sensitivity of the environment.

- The identification and evaluation of potential impacts in terms of vulnerability to climate risks – i.e. whether and how the considered [policy] [strategy] [programme] may lead to increased or reduced vulnerability to climate variability and climate change.
- An analysis of the performance indicators proposed for the considered [policy] [strategy] [programme] from an environmental perspective, i.e. with regard to their usefulness to identify the environmental effects (positive and negative) of [policy] [strategy] [programme] implementation or to monitor environmental and climate-related risks and constraints. A proposal should be made for the improvement of the existing performance assessment framework from the point of view of environmental and climate-related monitoring.
- An assessment of the capacities of regulatory authorities and other stakeholders to address environmental and climate-related challenges.
- Conclusions and recommendations for [policy] [strategy] [programme] formulation and implementation, including recommendations on: (i) on how to optimise positive impacts and make the best out of environment- and natural resource-related opportunities; (ii) how to mitigate negative effects, adapt to environmental constraints and manage climate-related risks. Recommendations may concern the selection of an alternative (if more than one alternative is envisaged), changes in [policy] [strategy] [programme] design, the integration of environment- and climate-related adaptation and mitigation measures, implementation and monitoring modalities, and institutional and capacity development measures.
- The limitations of the SEA and its assumptions should be presented. The recommendations should take into account the views presented by the stakeholders and explain how these were integrated. If some concerns were not integrated in the final recommendations, the reasons thereof should be given.
- Where relevant and possible, the presentation of assessment results will make use of visual tools (e.g. vulnerability maps), graphs, diagrams, figures and/or tables to facilitate the communication of results and enhance their use for advocacy and decision-making purposes.

### 5. METHODOLOGICAL ASPECTS

The initial proposal and scoping report should describe by which methods data will be collected and analysed, specifying where relevant which methods will apply to the identification and assessment of risks, constraints, opportunities and impacts, and which ones to the assessment of adaptation and mitigation options. The choice of methodological tools should be coherent with the scale of the analysis, the experience of the expert team and the resources available for the study.

The involvement of stakeholders in the study is a key success factor – hence the request to develop a stakeholder engagement strategy as part of the scoping work. Particular attention should be paid to involving typically less represented groups such as women, indigenous peoples and minority groups (as relevant based on the scope of the assessment).

### 6. WORK PLAN

A preliminary work plan including the proposed time schedule, covering the scoping and core studies, must be included in the initial proposal. A more detailed work plan for the core study must be included in the scoping study.

## 7. EXPERTISE REQUIRED

The proposed team of experts should (collectively) have proven skills and experience in the following areas *[add or remove elements on the basis of needs, focusing on essential skills in view of the context and objectives of the study, and taking account of available resources which may limit the size of the team of experts and therefore the range of available competences]*:

- Environmental and climate change science.
- The following technical domains: *(specify, e.g. soil conservation, water resource management, forestry, disaster risk reduction)*.
- Social sciences, with expertise in *(specify, e.g. economics, institutions, governance, capacity building)*.
- Development planning and the management of development programmes or projects, with expertise in *(specify, e.g. rural development, irrigation)*.
- Impact and/or risk assessment (e.g. environmental impact assessment, socio-economic impact assessment, technological risk assessment).
- Implementation of participatory methods (in relation to the stakeholder engagement strategy).

For each expert proposed, a *curriculum vitae* must be provided of no more than *(four)* pages setting out the relevant qualifications and experience.

## 8. REPORTING

### 8.1 Scoping study report

The draft scoping report in *[(number) copies (double-sided printing)]* [electronic version], drafted in *(language)*, is to be presented to *(names and organisations)* for comments by *(date)*. Comments should be expected by *(date)*. These comments will be taken into account in preparing the final scoping report. The final scoping report is to be submitted in *[(number) copies (double-sided printing)]* [electronic version] by *(date)*.

### 8.2 Core SEA study report

The draft study report in *[(number) copies (double-sided printing)]* [electronic version], drafted in *(language)*, is to be presented to *(names and organisations)* for comments [at a date to be agreed at the time of accepting the scoping report] [by *(date)* at the latest]. Comments should be expected within *(number)* weeks after submitting the draft report. These comments will be taken into account in preparing the final study report. The final study report is to be submitted in *[(number) copies (double-sided printing)]* [electronic version] within *(number)* weeks after receiving the last comments.

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## Appendix 6: Questionnaire for strategic environmental assessment (SEA) screening (adapted from: EC, 2011b)

Part I: Possible impacts, constraints and opportunities	YES	?	NO
<p><b>1. Are there any indications at this stage of negative environmental impacts that might be significant and require further study?</b> <i>The following characteristics can be useful to provide an idea of the impact's significance: probability, duration, frequency, reversibility, cumulative nature, magnitude and the affected area and/or population.</i></p>			
<p><b>2. Is the sector policy/programme likely to include a large number of Category A or B projects<sup>2</sup> that could interact to produce significant cumulative environmental impacts?</b></p>			
<p><b>3. Is the sector policy/programme likely to significantly affect valued areas or landscapes with national or international protection status?</b> <i>e.g. protected areas, cultural heritage sites</i></p>			
<p><b>4. Is the sector policy/programme likely to significantly affect known vulnerable areas?</b> <i>e.g. areas under environmental stress</i></p>			
<p><b>5. Does the sector policy/programme significantly increase the risk of a negative impact on human health or safety?</b> <i>e.g. increased vulnerability to natural disasters, significant exposure to hazardous materials</i></p>			
<p><b>6. Are there indications at this stage that the sector policy/programme will have a direct and significant influence on other environmentally sensitive sectors?</b> <i>e.g. an education programme could target agricultural practices, promoting environmentally damaging practices</i></p>			
<p><b>7. Is the achievement of the sector policy/programme's objectives directly and significantly dependent on the availability of scarce natural resources?</b> <i>e.g. the achievement of objectives in a rural development programme may be highly dependent on the availability of increasingly scarce water for irrigation</i></p>			
<p><b>8. Are there indications at this stage that the sector policy/programme may contribute to a significant increase in greenhouse gas emissions (relative to the current level of national emissions) or, on the contrary, has the potential to reduce such emissions or fix significant amounts of carbon?</b></p>			
<p><b>9. Are there indications at this stage that the sector policy/programme may substantially increase the vulnerability of the population to increasing climate variability and/or the expected effects of climate change?</b> <i>e.g. increased vulnerability to natural disasters</i></p>			

<sup>2</sup> This refers to the Environmental Impact Assessment (EIA) process, which applies at the project-level (not at the strategic level). Category A projects are those which are always likely to produce significant impacts on the environment (e.g. a coal-fired power plant), whereas Category B projects need to be analysed in more detailed (as part of the EIA screening process) to determine the need for an EIA.



Part II: Context and process	YES	?	NO
<p><b>10. Does analytical work exist that could inform the environmental screening of the sector policy/programme?</b>  <i>The Country Environmental Profile (CEP) could provide useful information, alongside any SEA or similar assessment that might already be available.</i></p>			
<p><b>11. Do the policy, programme, legal and regulatory framework promote sound environmental management at sector level?</b></p>			
<p><b>12. Are the partner institutions considering measures to address sector-related environmental concerns and exploit opportunities to contribute to the achievement of environmental and development goals?</b></p>			
<p><b>13. Do institutional capacities exist to implement those measures?</b></p>			
<p><b>14. Are there any local processes to promote harmonisation and alignment (involving multiple stakeholders: partner institutions, donors, development partners, non-governmental organisations and civil society) that may address sector-related environmental concerns?</b></p>			

### Interpreting the answers

If the answer to one or more of the questions under Part I of the screening questionnaire is **YES**, an SEA is in principle recommended. Local context and processes should be taken into account to identify whether action might already be underway or planned to address environmental sustainability concerns.

Should a decision be made not to carry out an SEA, this should be justified in the *summary of SEA screening outcomes*. In this case, issues under Part I and Part II of the screening questionnaire should be considered in the context of the formulation study.

## **Appendix 7: Examples of Indicators for monitoring climate change and climate change mainstreaming**

### **1. CLIMATE RISK AND VULNERABILITY INDICATORS**

- Frequency and intensity of climate-related natural disasters
- Extent of agricultural land at risk of flooding or drought
- Extent of rural areas at risk of flooding or landslides
- Population at risk from various types of extreme climatic events
- Infrastructure at risk from various types of extreme climatic events
- Proportion of the population living in poverty; number of poor people

### **2. INDICATORS FOR MONITORING POLICY AND INSTITUTIONAL CHANGE**

- Number of MAAIF sub-sector policies and plans that have been reviewed and updated in the light of climate change adaptation and mitigation considerations
- Resources allocated to adaptation and/or mitigation measures in ASSP budget
- Number of people/Proportion of staff trained in generic or specific competences required to mainstream climate change adaptation and/or mitigation in their work
- Rate of implementation of planned stakeholder consultations on climate-related issues

### **3. INDICATORS FOR MONITORING POLICY IMPLEMENTATION**

- Number of on-going and completed activities under the national development/plan that are linked to the mainstreaming of climate change
- Proportion of climate-related priority actions identified in agricultural sector plans that are or have been implemented
- Number of climate-related pilot projects implemented and evaluated for the purpose of drawing lessons and defining best practices
- Number of on-going and completed research projects with a focus on climate change adaptation and/or mitigation
- Proportion of capital expenditure projects submitted for public financing for which climate risk screening was undertaken
- Number of regulations adopted to support adaptation (e.g. zoning codes, building codes)
- Number/Proportion of district development plans based on climate-proofed planning
- Number/Proportion of farmers trained in climate change adaptation and management of climate risks
- Proportion of households (urban/rural) effectively covered by early warning systems for climate-related natural disasters
- Number of agricultural income generating enterprises undertaken by households

- Percentage of households that are food secure
- Number of agricultural income generating enterprises undertaken by households
- Number of groups set up for group marketing/bulking to increase household income
- Number of farmers practicing Climate Smart Agriculture (CSA) technologies
- Number of pests, vector and disease control interventions carried out

#### 4. INDICATORS FOR MONITORING POLICY OUTCOMES

- Proportion, and productivity, of farmland exploited using seed varieties, technologies and/or farming practices selected to better cope with climate variability and extremes
- Number/Proportion of farmers covered by an insurance against climate risks
- Number/Proportion of farmers with access to timely weather and climate forecasts
- Number/Proportion of farmers adopting high-yielding livestock breeds and pasture development for reducing methane production
- Carbon dioxide and other GHG emissions (annual total, per capita, % change against a base year) by agriculture

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