

A Review of Agricultural, Food Security, Food Systems and Climate Change Adaptation Policies, Institutions and Actors in East Africa

Working Paper No. 82

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
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Abstract

Agricultural production systems in East Africa are mainly rain-fed and highly vulnerable to climate change and variability. Moreover, the smallholder subsistence production base increases the vulnerability of the agricultural sector in East Africa to climate risks. The frequency and severity of climate shocks such as drought, heat and cold stress as well as floods are increasing and likely to lead to major food crises. Governmental and non-governmental actors in East African countries have instituted policies and programs aimed at increasing agricultural productivity, improving food security and enhancing adaptation to climate change. This paper examines the various policies, institutions and actors related to climate change adaptation, food security, food system and agricultural development in East Africa—focusing on Ethiopia, Kenya, Tanzania and Uganda. The paper combines a review of literature with key informant interviews from various actors in the four countries.

Governmental and non-governmental institutions are actively involved in the formulation of food security, food systems and climate change adaptation policies in East Africa. Several policies related to agriculture, food security and climate change already exist. Majority of the institutions interviewed had made progress in implementing climate change adaptation and mitigation projects. The most common mitigation projects undertaken relate to Clean Development Mechanisms (CMD) and Reducing Emissions from Deforestation and Forest Degradation (REDD+). The challenges in implementing agriculture and climate change related policies include limited technical capacity, program funding and infrastructure.

Previously, efforts towards addressing climate change in East Africa by the different actors were largely uncoordinated. In order to improve coordination of climate change issues in the region, climate change coordination units (CCCU) have been set up across the four countries. In Ethiopia, the Environmental Protection Authority (EPA) coordinates climate change initiatives in the country. In Kenya, a CCCU was set up at the Prime Minister's office. In Tanzania, a CCCU exists at the Vice President's Office, while in Uganda a similar CCCU has been set up under the Ministry of Water and Environment (MWE).

These findings give credence to calls for increased funding for climate change adaptation and mitigation in East Africa. Other alternative policy options emanating from the study include

increased investment in human capital development to enhance policy formulation and implementation, investment in agricultural infrastructure and markets and partnerships between local and international institutions to enhance the capacities of the local institutions.

Keywords

Agriculture; food security; policies; institutions and actors; East Africa.

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Acronyms

ASDS	Agriculture Sector Development Strategy
CCCU	Climate Change Coordination Unit
CCPC	Climate Change Policy Committee
CEEST	Centre for Energy, Environment, Science and Technology
CRGE	Climate Resilient Green Economy
DFID	Department of International Development
EPA	Ethiopian Environmental Protection Authority
EPACC	Ethiopian Programme of Adaptation to Climate Change
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GTP	Growth and Transformation Programme
KARI	Kenya Agricultural Research Institute
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MEMR	Ministry of Environment and Mineral Resources
MoFED	Ministry of Finance and Economic Development
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NARO	National Agricultural Research Organization
NCCRS	National Climate Change Response Strategy
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PMO	Prime Minister's Office
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SIDA	Swedish International Development Agency
SSA	Sub-Saharan Africa
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

Climate change represents one of the greatest environmental, social and economic threats facing the planet today. Sub-Saharan Africa (SSA) is among the regions of the world where the effects of climate change are being felt particularly hard. Climate change is a major threat to sustainable development and the attainment of the Millennium Development Goals (MDGs) in SSA. Climate change is expected to affect food and water resources that are critical for livelihoods in SSA where much of the population, especially the poor rely on local supply systems that are sensitive to climate variation. Thus, climate change would have a profound effect on food security in SSA, as increasing temperatures and shifting rain patterns reduce access to food.

Because of lack of economic development and institutional capacity, SSA countries are likely to be among the most vulnerable to the impacts of climate change (IPCC, 2001). The major impacts of climate change in SSA include changes in rainfall patterns, floods, droughts, increased disease incidence and emergence of new diseases, rising sea levels and a reduction in biodiversity. In general, much of the impact of climate change on agriculture is predicted to be through a reduction in the length of the growing period. However, in a few isolated areas such as the highlands of Kenya and Ethiopia, the impacts of climate change include increased precipitation and prolonged growing periods. Ensuring food security will require substantial investments and actions to adapt agriculture to climate change.

The long-term changes in climate will disproportionately affect regions in the Arid and Semi-arid (ASAL) parts of SSA, especially countries in East Africa that are heavily dependent on climate sensitive sectors, mainly agriculture and natural resources. Agriculture plays an important role in the livelihoods of majority of the population in the East Africa countries of Ethiopia, Kenya, Tanzania and Uganda. Over 70% of the population across the four countries is actively involved in agriculture (Table 1) and heavily rely on agriculture for food security, employment creation, income generation and foreign exchange.

Agriculture is estimated to contribute to 40% of the region's gross domestic product (GDP) (Kadi et al. 2011). The relative importance of the agriculture sector varies widely across the four countries. Contribution of the agricultural sector to GDP ranges from 25% in Kenya to

50% in Ethiopia. Smallholder farmers dominate the region’s agricultural sector and produce the bulk of the crop and livestock products. The share of smallholder agriculture ranges from 75% in Kenya, Tanzania and Uganda to 87% in Ethiopia (Table 1). However, the region is highly dependent on rainfed agriculture with irrigation accounting for less than 2% of agriculture. Moreover, the region experiences frequent extreme climate events including drought and floods which negatively affect agricultural productivity and the wellbeing of the population. The region’s heavy reliance on rainfed agriculture coupled with the unstable macroeconomic factors makes it highly vulnerable to the adverse effects of climate change.

Table 1. East Africa macroeconomic indicators (2010)

Indicator	Ethiopia	Kenya	Tanzania	Uganda
GDP per capita (US\$ Current)	350	808	545	500
GDP growth rate (%)	8.0	5.6	6.4	5.2
Contribution of Agriculture to GDP (%)	50	25	46	30
Population in agriculture (%)	77	71	73	73
Share of smallholders in agriculture (%)	87	75	75	75
Population growth rate (%)	2.2	2.7	3.0	3.3
Irrigated agriculture (%)	0.3	0.2	2.0	3.8
Poverty rate (National poverty line) (%)	39	46	33	31

Source: African Development Bank (AfDB) 2010

In terms of economic development, three of the countries—Ethiopia, Tanzania and Uganda—are least developed countries, two of which are landlocked (Ethiopia and Uganda). Kenya is a middle-income country. Per capita GDP in purchasing power parity (PPP) in 2010 varied widely, ranging from US\$350 in Ethiopia to US\$808 in Kenya with impressive GDP growth rates of more than 5% (Table 1). However, the impressive growth rates are dampened by high levels of poverty with over one-third of the population living below the poverty line, and with a population growth rate of more than 2% (Table 1).

Within the region, the effects of climate change vary across farming and food systems, households, and individuals. Moreover, other simultaneous global changes, including changing trade patterns and energy policies, have the potential to exacerbate the negative effects of climate change on food systems and livelihood groups. Climate change is anticipated to increase the frequency of extreme climate events like droughts and floods already experienced in East Africa. While most economic sectors are expected to be negatively impacted, agriculture is singled out to be the most vulnerable in the region due to

its dependence on rainfall and other climatic variables. Poor households are expected to be worst hit due to their vulnerability and low adaptive capacity. The extreme weather events are expected to disrupt their livelihoods resulting in food insecurity and increased poverty levels in the region. To effectively deal with the impacts of climate change on vulnerable communities, concerted efforts are needed to boost their adaptive capacity.

Climate change impacts have the potential to undermine and even undo progress made in reducing poverty, attaining MDGs and improving the socio-economic well-being of the population in East Africa. The negative impacts associated with climate change are also compounded by many factors, including widespread poverty, human diseases, and high population growth, which is estimated to double the demand for food, water, and livestock forage within the next 30 years (Davidson et al. 2003). The implications of climate change on development makes risk management, mitigation and adaptation essential in responding to the impacts of climate change.

Policy makers have recognized the need to integrate climate change adaptation, mitigation and risk management into all spheres of public policy-making. This integration requires a focus on key climate change governance issues such as institutional arrangements and capacities, effective mechanisms for delivery, and mechanisms to ensure that adaptation efforts target and benefit the most vulnerable sectors of the society. Yet, adequate funding and technological assistance to build resilience and support adaptation are required (Hepworth 2010). Moreover, an appropriate institutional arrangement is needed to facilitate adaptation to climate change, possibly under a legally binding framework. Available evidence, however, indicates that the efforts of organizations involved in formulating climate change-related policies in the region remain poorly coordinated.

Recently, governmental and non-governmental actors in Ethiopia, Kenya, Tanzania and Uganda have instituted policies and programs aimed at increasing agricultural productivity, improving food security and climate change adaptation. Despite these efforts, the current policies and actors are poorly understood and have not been documented. Moreover, the adequacy of these policies in tackling climate change impacts on agriculture has not been assessed. This paper examines the various policies, institutions and actors related to climate change adaptation, food security, food systems and agricultural development in CCAFS focus

countries in East Africa— Ethiopia, Kenya, Tanzania, and Uganda. In addition, the study assesses the adequacy of current climate change and agriculture related policies.

2. Study approach

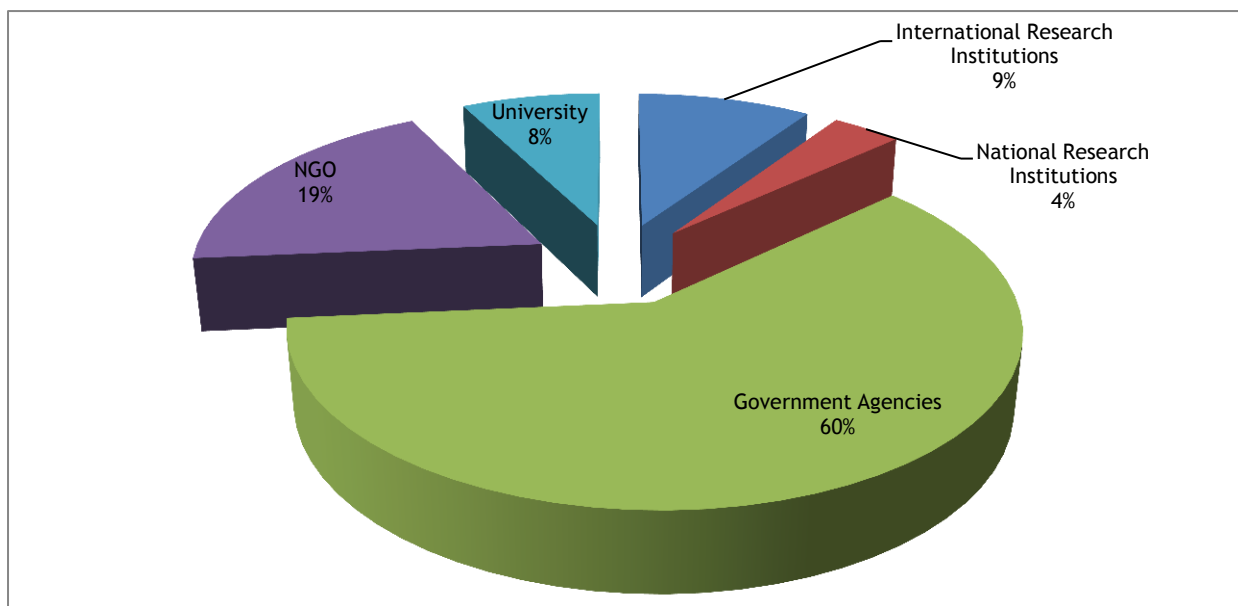
The study combines literature review with face to face interviews of 53 key informants across the four countries. A semi-structured questionnaire was used to interview representatives from government institutions, civil society organizations, project contact persons and the private sector representatives in 2011. Of the 53 respondents interviewed, 28% were from Ethiopia, 15% from Kenya, 34% from Tanzania, and 21% from Uganda. The government departments interviewed included agriculture, energy, environment, meteorology, water and climate change coordinating agencies. Others interviewed included research institutions, donor agencies and non-governmental organizations (NGOs). In each country, a national facilitator reviewed literature, collected data and prepared the draft national report. Overall, the study was coordinated by a regional facilitator, who analysed the survey data and synthesized the national reports into a regional report, including filling in existing gaps.

3. Overview of climate change actors and policies in East Africa

This section presents an overview of the agriculture, food security, and food systems policy actors and links their institutions with the policies that have been developed to tackle climate change. It begins by exploring the main actors across the region and narrowing down to the country specific cases. Finally, the climate change policies formulated by the institutions are discussed.

A number of institutions are actively involved in the formulation of agriculture, food security, food systems and climate change adaptation policies in East Africa. These institutions can broadly be classified into the following categories: government actors (central and local), non-state actors (NGOs, research institutions and civil society, development partners and donor agencies. Figure 1 shows the distribution of the types of policy institutions surveyed.

Figure 1. Policy institutions in East Africa



Sixty percent of the 53 policy institutions surveyed within the region were government agencies (Figure 1). Other actors included NGOs, International Research Institutions, Universities, and National Research Institutions in decreasing order of importance (Figure 1). Evidently, government actors are the dominant policy making agencies in East Africa. However, the efforts of these actors towards addressing agriculture, food security, food systems and climate change issues are largely uncoordinated leading to duplication of actions in some cases. In recent years, national governments are making efforts to improve coordination of climate change issues across the four countries in the region.

3.1 Ethiopia

The government of Ethiopia has implemented different policies and programs aimed at reducing the negative effects of climate change and improving agricultural productivity and food security. This study identified a total of 15 food security and climate change-related policy institutions in Ethiopia (Figure 2). The Environmental Protection Authority (EPA) is the United Nations Framework Convention on Climate Change (UNFCCC) national focal point in Ethiopia, and is responsible for the engagements in the international climate change negotiations. EPA coordinates formulation of climate change policy, acts as the focal institution in the development of strategies and plans related to climate change, and follows up all climate change related programmes, projects and activities in the country. EPA was originally set up to coordinate environmental issues in the country. Before EPA was

designated as the national climate change focal institution, there was lack of clarity and poor coordination of climate change activities in the country, and thus delaying the development of the national climate change strategy.

Other important institutions involved in climate change issues identified in Ethiopia included the National Meteorology Agency (NMA), the Ministry of Water Resources (MoWR), the Ministry of Agriculture and Rural Development (MoARD), the Ministry of Finance and Economic Development (MoFED), Ethiopian Institute of Agricultural Research (EIAR), Disaster Prevention and Preparedness Agency, Addis Ababa University, Mekelle University, development partners such as the United Nations Development Programme (UNDP), Global Green Growth Institute (GGGI), World Food Programme (WFP), the Japanese Government and Africa Union Commission, Africa Climate Policy Centre (ACPC) and NGOs such as Climate Change Forum - Ethiopia, Institute of Biodiversity Conservation, Environment Economics Policy Forum for Ethiopia and Forum for Environment.

EPA in close collaboration with UNDP and MoFED have set up the Climate Facility to raise funds for implementing the Climate Resilient Green Economy (CRGE) Strategy—from donor agencies, development partners and private sector. The government of Ethiopia considers climate change adaptation as a development issue and has mainstreamed it in its growth plans. Several climate change adaptation and mitigation projects and programs that relate to agriculture, food security and food systems are currently on-going, and mainly supported by donor agencies and development partners with the government at the federal and regional levels playing a key role in implementation.

Figure 2. Ethiopia actors landscape on climate change



Source: Authors compilation

The government has put in place a five-year Growth and Transformation Plan (GTP) (2010/11-2014/15). The GTP is expected to put the country on a trajectory towards achieving a middle income status by 2025. In order to achieve this, the government plans to pursue a carbon neutral and climate resilient development pathway. The government is currently in the process of developing a CRGE strategy, a process coordinated by EPA. CRGE has two main components—adaptation to climate change and mitigation—including an overarching framework for financing the strategy. Ethiopia’s Programme of Adaptation to Climate Change (EPACC) is an ongoing program of action to build a climate resilient economy through support for adaptation at sectoral, regional and community levels.

EPACC replaces Ethiopia’s National Adaptation Programme of Action (NAPA) submitted to the UNFCCC in 2007. The project steering committee, comprising of members from different sectors developed the 2007 adaptation plan, where experts from National Meteorological Agency, Ministry of Water and Energy, Ministry of Agriculture, EIAR, Ministry of Health, Institute of Biodiversity Conservation, Addis Ababa University and NGOs played a major role. Furthermore, EPA coordinated and funded the development of five sectoral adaptation plans for the Ministry of Water and Energy, Ministry of Mines, Ministry of Agriculture, Ministry of Urban Works. Also, nine regional states and two city administration units have submitted their adaptation plans.

The implementation of the CRGE will cut across almost all the ministries. While EPA is expected to coordinate the CRGE process, some actors feel that there is need to change the

mission and vision of EPA to accommodate broad development aspects other than environment. In formulation and implementation of the CRGE, an inter-ministerial taskforce was formed, with EPA as the coordinating institution. Of all the federal ministries, the Ministry of Agriculture is the only one with a climate change unit. However, there are plans to create climate change units across all federal ministries to effectively implement the CRGE strategy.

3.2 Kenya

In Kenya, the Ministry of Environment and Mineral Resources (MEMR) is the focal point for climate change activities and also serves as the national UNFCCC focal point. The National Environment Management Authority (NEMA)—a parastatal within the MEMR—is the designated national authority responsible for approving climate change mitigation projects under the Kyoto protocol. The Kenya Meteorological Service (KMS) within MEMR, provides meteorological and climatological services to agriculture, forestry, water resources management, civil aviation and the private sector.

A total of nine climate change-related policy institutions were interviewed in Kenya (Figure 3). The institutions included government ministries and institutions such as MEMR, the Ministry of Agriculture (MoA), Ministry of Forestry and Wildlife (MoFW), NEMA, the Climate Change Coordination Unit (CCCU) at the Prime Minister's Office (PMO), International Development Research Center (IDRC), the private sector, development partners, civil society as well as research and academic institutions. A climate change coordination unit has been set up in Kenya at the Prime Minister's Office.

Kenya developed a climate change framework—the National Climate Change Response Strategy (NCCRS 2010). The NCCRS addresses measures for adaptation and mitigation cutting across the main economic sectors of the country. The adaptation and mitigation interventions for the agricultural sector within the NCCRS were developed through a consultative process involving all stakeholders mainly from government, private sector, NGOs, civil society organizations, and the local communities. The NCCRS (2010) and the Agricultural Sector Development Strategy (ASDS 2010-2020) are the government blueprint documents that embrace some aspects of climate change adaptation and mitigation in agriculture.

Figure 3. Kenya actors landscape on climate change



Source: Authors compilation

Apart from these two documents, the Ministry of Agriculture (MoA) and the Kenya Agricultural Research Institute (KARI) have set up independent Climate Change Units (CCU) under the Engineering Services department and Natural Resource Management Departments, respectively. The KARI CCU serves as a focal point for climate change related research and aims to develop the capacity of KARI scientists to understand and develop adaptation technologies and techniques to help smallholder farmers and small and medium enterprises and agribusinesses respond to the effects of climate change. The unit also aims to support agricultural advisory services through the development of appropriate advisory packages for climate risk management and minimize vulnerability, stabilize and improve yields in agriculture.

Several agricultural adaptation and mitigation projects have been developed by MoA, KARI, Kenya Forest Service (KFS), Kenya Forestry Research Institute (KEFRI), and World Agroforestry Centre (ICRAF) among others. The activities, however, cut across the different institutions and are not coordinated. Funding for the climate change activities are from various institutions including Rockefeller Foundation, IDRC, Food and Agricultural Organization of the United Nations (FAO), ICRAF, Swedish International Development Agency (SIDA), World Bank (through International Finance Corporation - IFC) and DFID.

Other major actors in climate change adaptation and mitigation in agriculture include the private sector, Civil Society Organizations (CSOs) including NGOs, major donors and other influential individuals. These institutions provide finances, technology transfer, and capacity

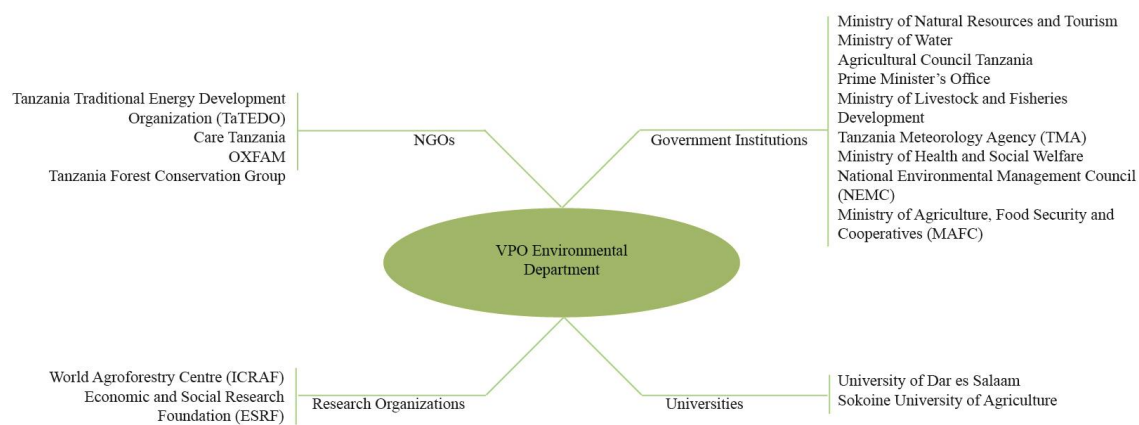
building needs in climate change in the agricultural sector. Some of the non-governmental institutions include African Center for Technology Studies (ACTS), German Development Cooperation (through German International Cooperation - GIZ), Kenya Climate Change Working Group (KCCWG), Practical Action Eastern Africa and Care International. Private sector actors include UAP Insurance in collaboration with Safaricom which have designed an insurance package—Kilimo Salama Plus—that insures crop farmers and livestock keepers against climate change related risks, mainly drought and excess rain.

3.3 Tanzania

In Tanzania, 18 agriculture and climate change policy institutions were identified (Figure 4). The Division of Environment in the Vice President's Office (VPO) is the national focal point for all climate change adaptation and mitigation activities in Tanzania. Other key policy institutions include the Tanzania Meteorological Agency (TMA), the Ministries of Agriculture, Food Security and Cooperatives, Livestock, Fisheries, Water, Energy and Natural Resources. A National Climate Change Steering Committee (NCCSC) has been set up with the Centre for Energy, Environment, Science and Technology (CEEST) acting as the Secretariat.

The NCCSC is an inter-institutional body comprising of representatives from various relevant ministries, parastatals and NGOs. The representatives include the following members and institutions: Director of Environment, Director of Meteorology, Director of CEEST, Director General of National Environment Management Council (NEMC), Commissioner for Energy, Director of Forestry, Commissioner of Agriculture and Livestock Development, Director of Fisheries, Director of Heavy Industries, Vice Chancellor University of Dar es Salaam, and a representative from the Ministry of Foreign Affairs.

Figure 4. Tanzania actors landscape on agriculture and climate change



Source: Authors compilation

In response to climate variability and climate change impacts on natural and social systems, several national programs and strategies have been developed in line with international agreements such as UNFCCC and its Kyoto Protocol. Several other sector specific programs and strategies that incorporate climate change issues are also being implemented. Examples of such programs and strategies include the Agriculture Sector Development Program, National Forest Program, National Beekeeping Program, National Strategy for Economic Growth and Reduction of Poverty, Rural Development Strategy and Tanzania Development Vision 2025 (that provides national priorities for development). Many NGOs, donor agencies and CSOs are initiating projects and programs on climate change adaptation and mitigation in agriculture and other sectors of the economy. These include CARE Tanzania, FAO, UNDP, IFAD, USAID, DFID, DANIDA, United Nations Environmental Program (UNEP), IUCN, SIDA, Carbon Tanzania and Tanzania Forest Conservation Group.

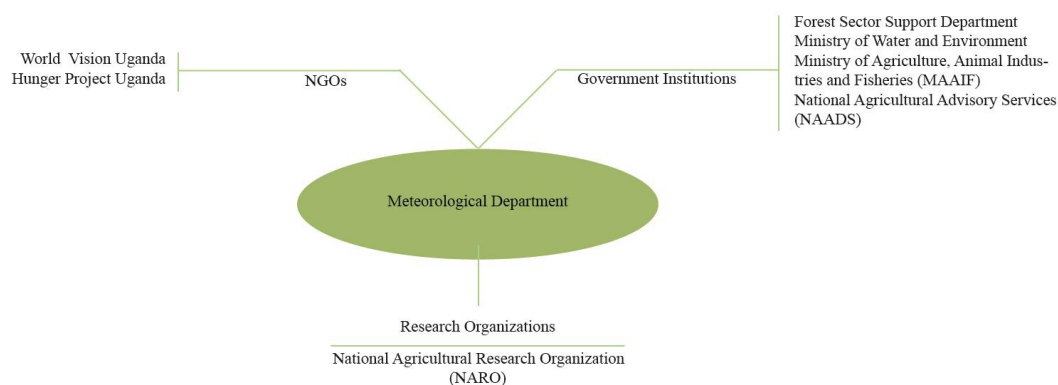
3.4 Uganda

In Uganda, 11 different actors from 10 institutions working on some aspects of climate change were identified (Figure5). The Meteorological Department within the Ministry of Water and Environment (MWE) is the national climate change focal point under the UNFCCC. Other important policy institutions include the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Department of Disaster Management and Refugees within the Prime Minister's Office, development partners, NGOs, academic institutions and the private sector.

The government set up a climate change unit in the Ministry of Water and Environment in 2008, with financial support from the Royal Danish Embassy to coordinate climate change activities in the country. Various committees have also been formed to address climate change in the country and these include the Multi-sectoral National Climate Change Committee, National Climate Change Steering Committee, Inter-sectoral Technical Committee, and Water and Environment Sector Working Group.

Other government institutions active in climate change activities in Uganda include National Forest Authority (NFA), National Environment Management Authority (NEMA), National Forestry Resources Research Institute (NaFORRI), National Agricultural Research Organisation (NARO) and Forest Sector Support Department (FSSD). Apart from government departments, several NGOs, CSOs and donor agencies are involved in climate change adaptation and mitigation efforts in agriculture and other sectors, including UNDP, FAO, Oxfam, Care, World Vision, Climate Change Concern, Environment Management for Livelihood Improvement and Climate and Development Initiatives.

Figure 5. Uganda actors landscape on climate change



Source: Authors compilation

The government also established the Climate Change Policy Committee (CCPC) that brings together various ministries and departments and provides policy guidance on climate change. An inter-sectoral/institutional Climate Change Technical Committee was established in July 2010 and works alongside the CCPC—to provide technical advice on climate change. Currently there are initiatives towards building the capacity of research institutions and individuals involved in climate change adaptation and agriculture. The Rockefeller Foundation, for example, is funding a project to strengthen the capacity of NARO to develop

climate change adaptation interventions and policy recommendations that ensure their adoption. At the same time Makerere University is integrating climate change into their agricultural curriculum to better equip the students with relevant knowledge and skills in climate change and agriculture. There is need for more of such initiatives to prepare the country to overcome climate change impacts and capitalize on the opportunities that come along with anticipated changes in climate.

Recently, there is an increased interest in agriculture and climate change-related policies in East Africa. Consequently, climate change coordination units have been set up across the four countries surveyed. These coordination units are based at EPA in Ethiopia, the Prime Minister's Office in Kenya, the Ministry of Water and Environment in Uganda, while in Tanzania the unit is based at the Vice President's Office. In addition, all four countries have designated UNFCCC national focal offices. The next section analyses the various policies formulated by these institutions.

4. Agriculture, food security and climate change policies in East Africa

A number of policies that relate to agriculture, food security and climate change exist in East Africa. Majority of the policies relate to agriculture, environment, forestry, energy, health, natural resource management and sustainable management of the Arid and Semi-Arid Lands (ASALs).

4.1. Ethiopia

Most of the policies and programs for developing the agricultural sector and improving food security by the government of Ethiopia are guided by the 1993 Agricultural Development Led Industrialization (ADLI) strategy. ADLI aims to bring about a structural transformation in productivity of the agricultural sector. The Ministry of Agriculture and Rural Development (MoARD) spearheaded the formulation of ADLI (Table 2). Other agricultural policies formulated by the MoARD include the Rural Development Policy of 2002, the Food Security Strategy of 2002, the Land Use Policy of 2004 and the Agricultural Marketing Strategy of 2005 (Table 2).

Food security reforms in Ethiopia were initiated in 2002 under the Food Security Strategy. The main objective of the strategy was to ensure food security at the household level. Other new ideas were also implemented to address the needs of food insecure households in more sustainable ways. The Food Security Strategy consists of four major components: voluntary resettlement programme, direct food production, income diversification and the productive safety net programme (Food Security Strategy, 2002).

The Disaster Prevention and Preparedness Commission (DPPC) was established in 1995, to succeed its predecessor the Relief and Rehabilitation Commission established in June 1974. The DPPC has three main responsibilities: disaster prevention by tackling their root causes, ensure preparedness by building the capacity needed to reduce the negative consequences and impact of disasters, and respond to disasters and provide necessary emergency assistance to victims in a timely manner. One of the areas of focus by the commission is reduction of vulnerability to famine and food shortages. The commission uses relief assistance and community-based projects as tools for dealing with famine disasters. In addition, it tries to link its endeavor to improve food security with contributing to development through environmental protection, development of infrastructure and building of community assets.

The MoFED in Ethiopia is primarily responsible for preparation and implementation of national development plans. Through MoFED in collaboration with MoARD, the government has put in place several development plans. These include the Sustainable Development and Poverty Reduction Program (SDPRP) of 2002/03-2004/05 and a plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06 to 2009/10). As follow up to SDPRP and PASDEP, the government has prepared the Growth and Transformation Plan (GTP) for the period 2010/11-2014/15. GTP has been endorsed by the Council of Ministers and the House of People's Representative.

Table 2. Agriculture, food security and climate change policies in Ethiopia

Institution	Policy	Status
Ministry of Agriculture and Rural Development (MoARD)	<ul style="list-style-type: none"> • Agricultural Development Led Industrialization (ADLI) • Rural Development Strategies and Instruments • Food Security Strategy • Agricultural Marketing Strategy • Rural Land Administration and Land Use Policy 	<ul style="list-style-type: none"> • Ratified 2002 • Ratified 2002 • Ratified 2002 • Ratified 2005 • Ratified 2004
Ministry of Finance and Economic Development (MoFED)	<ul style="list-style-type: none"> • Sustainable Development and Poverty Reduction Programme (SDPRP) • Plan for Accelerated and Sustained Development to End Poverty (PASDEP) 	<ul style="list-style-type: none"> • Working Strategy 2002/03-2004/05 • Working Strategy 2005/06 -2009/10
Disaster Prevention and Preparedness Commission (DPPC)	<ul style="list-style-type: none"> • National Policy on Disaster Prevention and Management • Emergency Food Security Reserve (EFSR) • National Disaster Prevention and Preparedness Fund (NDPPF) 	<ul style="list-style-type: none"> • Proclamation number 10/1995 • Established Pro. 67/2000 • Established under the Pro.212/2000
Environmental Protection Authority (EPA)	<ul style="list-style-type: none"> • Conservation Strategy of Ethiopia • Environmental Policy of Ethiopia • National Adaptation Plan of Action (NAPA) 	<ul style="list-style-type: none"> • Ratified 1997 • Ratified 1997 • 2007/2010/2011
Ministry of Water and Energy (MWE)	<ul style="list-style-type: none"> • Energy Policy of Ethiopia • Water Policy 	<ul style="list-style-type: none"> • Ratified 1994 • Ratified 1999

Source: Authors compilation

The MoFED in collaboration with EPA formulated the Conservation Strategy of Ethiopia in 1997 (Table 2). The Conservation Strategy has five main components that promote sustainable development. The first component evaluates the state of natural resources and development in the country. Policy and strategy frameworks are introduced in the second component, aimed at ensuring sustainable use and management of natural resources, and the third component deals with institutional and implementation issues. The last two components focus on priorities for sustainable development—short term, medium and long term sustainable programmes and implementation of the policy and strategy, respectively.

The EPA and DPPC are the only government institutions formulating climate change related policies in Ethiopia. These two institutions were responsible for the ratification of the Environmental Policy of Ethiopia in 1997, and the National Policy on Disaster Prevention and Management in 1995 (Table 2). More recently, EPA developed a separate work program of action on climate change adaptation. Ethiopia ratified the UNFCCC (1994) and its related Kyoto Protocol (2005), and submitted its initial national communications in 2001 and

National Adaptation Program of Action (NAPA) in 2007 to the UNFCCC. The government also submitted its Nationally Appropriate Mitigation Action (NAMA) plan to the UNFCCC in 2010.

4.2. Kenya

Agricultural policy in Kenya focuses on increasing productivity and income growth especially for smallholders, enhancing food security and equity, irrigation, commercialization and intensification among small scale farmers, appropriate and participatory policy formulation and environmental sustainability. The agricultural sector draws a lot of interest from different actors and stakeholders in the formulation of its policies.

A diverse range of policies have been used to foster growth in the agricultural sector. The Ministry of Agriculture (MoA) developed the Swynnerton plan in 1954 to guide the development of African Agriculture during the colonial period (Table 3). At independence, agricultural policies in Kenya were based on the principles outlined in Sessional Paper No. 10 of 1964 on African Socialism and its Applications to Planning in Kenya (Table 3). This sessional paper emphasized political equity, social justice and human dignity as advocated by the then Ministry of Economic Planning and Development (currently the Ministry of Finance and Planning).

The Ministry of Agriculture was primarily responsible for directing agricultural policy in Kenya, yet actual implementation of the policy was undertaken by a number of public institutions. The legal framework governing the operation of the agricultural sector is spelt out in the Agriculture Act Cap 318 of the laws of Kenya of 1967 (Table 3). Specific policies and strategies for agricultural development have clearly been defined in various policy documents such as the Sessional Paper No. 4 of 1981, Sessional Paper No. 1 of 1986, Sessional Paper No. 1 1992 (Development and Employment in Kenya), Sessional Paper No. 2 of 1994 (National Food Policy) and the various five year National Development Plans. The policies and plans focused mainly on improving economic management, accelerating national development, reducing poverty and increasing food security. Sessional Paper No. 2 is still the operational policy document on food security on Kenya. The MoA, however, is in the process of revising the national food policy into a National Food and Nutrition Policy.

Table 3. Agriculture, food security and climate change policies in Kenya

Institution	Policy	Enacted
Ministry of Agriculture (MoA)	<ul style="list-style-type: none"> • Swynnerton Plan • Agriculture Act Cap 318 • Sessional Paper No. 4: 1981 on National Food Policy • Sessional Paper No. 1 of 1994 on National Food Policy • Strategy for Revitalization of Agriculture • Agriculture Sector Development Strategy 	<ul style="list-style-type: none"> • 1954 • 1967 • 1981 • 1994 • 2004 • 2009
Ministry of Finance and Planning (MoFP)	<ul style="list-style-type: none"> • Sessional paper No. 10: 1964 on African Socialism and its Application to Planning in Kenya • Sessional paper No. 1 of 1986 on Economic Management for Renewed Growth • Sessional Paper No. 1 of 1992 on Development and Employment in Kenya • Economic Recovery Strategy Paper for Wealth and Employment Creation • Vision 2030 	<ul style="list-style-type: none"> • 1964 • 1986 • 1992 • 2003 • 2008
Ministry of Environment and Mineral Resources (MEMR)	<ul style="list-style-type: none"> • Environmental Management and Coordination Act No. 8 of 1999 • National Climate Change Response Strategy 	<ul style="list-style-type: none"> • 2000 • 2011
Ministry of Water and Irrigation	<ul style="list-style-type: none"> • Water Act 	<ul style="list-style-type: none"> • 2002
Ministry of Energy	<ul style="list-style-type: none"> • Sessional Paper No. 4 of 2004 on Energy Policy 	<ul style="list-style-type: none"> • 2004
Ministry of Wildlife and Forestry	<ul style="list-style-type: none"> • Sessional paper No. 1 of 2007 on Forestry Policy 	<ul style="list-style-type: none"> • 2007

Source: Authors compilation

The outcomes of past agricultural policies and reforms were not always positive. This was exacerbated by political mismanagement, making the attainment of food security elusive. It therefore became imperative that the government had to rethink its policies and development programs. This culminated in the development and launch of a broad development framework—the Economic Recovery Strategy for Wealth and Employment Creation (ERS-WEC 2003-2007) by the Ministry of Finance and Planning (GoK 2003). The ERS outlined the development strategies and priority interventions that were to be undertaken to successfully bring the economy back to a sustainable growth path. These policy interventions contributed to a sustained recovery. Growth in the agricultural sector started to pick up in 2002, rising to 1.8 percent in 2004, and to a high of 6.7 percent in 2005, before falling to 4.4 percent in 2006 (MoA 2008).

Following the expiry of ERS in December 2007, the government embarked on a new long-term economic blueprint to guide national development in the next 23 years—Kenya Vision 2030. In 2004, the Strategy for Revitalization of Agriculture (SRA) was developed by the MoA as a sectoral vision that ties well with the ERS. The SRA has now been aligned with

Vision 2030 alongside other development programs, both within and outside the agriculture sector thus resulting in the new ASDS (2009- 2018). The ASDS recognizes that SRA has achieved its objective of revitalizing agriculture to the extent that it is now on a development trajectory.

The Ministry of Planning, National Development and Vision 2030 is responsible for leading and coordinating preparation of National Development Plans in Kenya, including the District Development Plans and specific socio-economic programs and plans. The Medium Term Plan (MTP) 2008-2012 is the first in a series of successive 5-year medium term plans to implement the Kenya Vision 2030. Vision 2030 recognizes agriculture as an important sector that will play a critical role to deliver the 10 percent annual economic growth rate target set under the economic pillar. To effectively contribute to economic development and growth, transforming smallholder agriculture from subsistence to an innovative, commercially oriented and modern agricultural sector is an option currently being explored by the government through diverse initiatives. Vision 2030 also identified four major challenges facing the agricultural sector that undermine its contribution to economic growth: productivity level below the existing potential, underutilization of land, inefficiencies in marketing, and limited value addition to agricultural produce.

Analysis of existing environmental policy and legal framework reveals that Kenya currently has no policies or laws that deal directly and explicitly with climate change. The only policy that has attempted to address climate change to some extent is the draft National Environmental Policy (NEP) of 2008 by MEMR. Prior to NEP, the Environmental Management and Coordination Act (EMCA) of 1999 provided the legal framework for the management of the environment. Recently, the MEMR enacted the National Climate Change Response Strategy (NCCRS) of 2010 to guide the implementation of policies that directly address climate change. Kenya's first National Communication to the UNFCCC was in October 2002 at the Eighth Conference of the Parties (COP8) in New Delhi.

The process of developing the second National Communication to the UNFCCC begun in 2009, coordinated by NEMA, who prepared the first National Communication to the UNFCCC. In June 2011, Kenya participated in a UNFCCC Workshop on NAMAs and presented the government's approach towards development of NAMAs, which is through

development of a National Climate Change Action Plan (NCCAP) to facilitate implementation of the NCCRS.

The MEMR coordinated the development of the NCCAP with support from the Common Market for Eastern and Southern Africa (COMESA), Climate and Development Knowledge Network (CDKN), DFID, and the French Development Agency. Currently, the Second National communication is in its final stages as the work plan has been revised twice and forwarded to Global Environment Facility (GEF) for approval. NCCAP has 8 sub-components, and sub-component 3 is to develop a National Adaptation Plan (NAP) that aims to identify priority immediate, medium and long-term adaptation actions in the country.

Adaptation to climate change in the agriculture sector covers all actions that are aimed at reducing climatic impacts caused by climatic changes. Several countries have come up with adaptation policies that are designed to tackle current and future climate change impacts. Since developing countries are the most vulnerable to climate change, the UNFCCC came up with an initiative for Least Developed Countries (LDCs) to develop National Adaptation Programmes of Action (NAPAs), to identify priority activities that respond to their urgent and immediate needs to adapt to climate change. The funds to support priority activities identified in the NAPAs are available through the GEF's LDC Fund.

Kenya is not an LDC, but is in the category of Less Economically Developed Countries (LECD) thus does not qualify for GEF's LDC fund to develop NAPAs. However, the country might benefit from the Adaptation Fund of the UNFCCC (Cancun Adaptation Fund – CAF) an expansion of GEF's LDC Fund to include LEDC like Kenya, to establish National Adaptation Plan (NAP). Other important climate change related policies include Sessional Paper No 4 of 2004 (Energy policy), Sessional Paper No 1 of 2007 (Draft Forestry Policy) and the draft Arid and Semi-Arid Lands Policy of 2008. However, majority of these policies lean towards environmental management, yet climate change goes beyond environmental management.

4.3. Tanzania

There are a number of policies related to agriculture, environment, food security and climate change in Tanzania. Majority of these policies have been formulated by various government departments. The key ministries involved in agriculture related policies include the Ministry of Agriculture, Food Security and Cooperatives (MAFC), Ministry of Natural Resources and Tourism, Ministry of Water and Irrigation, Ministry of Lands, Ministry of Energy and Minerals, and the Ministry of Livestock and Fisheries Development (Table 4). These ministries have formulated some of the 16 policies that are presented in Table 4. Policies that promote agricultural and livestock productivity are spelt out in the Agriculture and Livestock Policy of 1997 and the Agricultural Sector Development Strategy of 2005 (Table 4). On the other hand, food security policies are contained in the National Food Security Policy of 2005.

In response to the impacts of climate change and variability on natural and social systems, several national programs and strategies have been developed in accordance with the international agreements, mainly the UNFCCC and the Kyoto Protocol. Tanzania is a signatory to the Kyoto Protocol. Consequently, the Initial National Communication in Tanzania is being implemented as a national strategy to communicate emissions and plans for mitigation, and adaptation needs to UNFCCC. Similarly, since 2006, the NAPA was developed as a national strategy to prioritize adaptation measures.

The United Nations Convention to Combat Desertification (UNCCD) of 1992 had great influence on the development of the Tanzanian National Environment Action Plan and the National Environment Policy that eventually led to the development of the National Action Plan to combat drought and desertification. The implementation of the National Action Plan to combat drought and desertification strategies focuses on promoting sustainable land management (SLM) as an important aspect in implementing the UNCCD. Tanzania has potential for developing climate change mitigation and adaptation projects for the agricultural sector.

Table 4. Agriculture, food security and climate change policies in Tanzania

Institution	Policy	Enacted
Ministry of Health and Social Welfare	<ul style="list-style-type: none"> National Health Policy 	<ul style="list-style-type: none"> 1992
Ministry of Lands, Housing and Human Settlements Development	<ul style="list-style-type: none"> National Land Policy 	<ul style="list-style-type: none"> 1997
Ministry of Natural Resources and Tourism	<ul style="list-style-type: none"> National Environment Policy 	<ul style="list-style-type: none"> 1997
Ministry of Agriculture, Food Security and Cooperatives (MAFC)	<ul style="list-style-type: none"> Agriculture and Livestock Policy 	<ul style="list-style-type: none"> 1997
Ministry of Natural Resources and Tourism (MNRT)	<ul style="list-style-type: none"> National Forestry Policy Wildlife Policy Tourism Policy 	<ul style="list-style-type: none"> 1998 1998 1999
Ministry of Water and Irrigation	<ul style="list-style-type: none"> National Water Policy 	<ul style="list-style-type: none"> 2002
Ministry of Energy and Minerals	<ul style="list-style-type: none"> National Energy Policy 	<ul style="list-style-type: none"> 2003
Office of the Prime Minister	<ul style="list-style-type: none"> National Disaster Management Policy 	<ul style="list-style-type: none"> 2004
Ministry of Agriculture, Food Security and Cooperatives (MAFC)	<ul style="list-style-type: none"> National Food Security Policy Agricultural Sector Development Strategy 	<ul style="list-style-type: none"> 2005 2005
Ministry of Livestock and Fisheries Development	<ul style="list-style-type: none"> National Livestock Policy National Aquaculture Policy Grazing Land and Animal Feed Act National Fisheries Policy 	<ul style="list-style-type: none"> 2006 2009 2010 2011

Source: Authors compilation

4.4. Uganda

In Uganda, most food security and food systems related policies have been formulated by three key Ministries, namely, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Ministry of Water and Environment (MWE), and Ministry of Lands (Table 5). Other government departments and institutions involved in food security and food systems policy formulation include the National Agricultural Research Organization (NARO) and the Office of the Prime Minister that have developed the National Agriculture Research Policy and the Disaster Management Policy, respectively (Table 5). The crops division of MAAIF has been involved in the formulation of 11 crop-related policies which are at different stages of implementation (Table 5). These include policies on Food and Nutrition, Organic Agriculture, Coffee, Tea, Seeds, Irish Potatoes, Vegetable Oil Development, Cocoa and Urban Agriculture among others.

Table 5. Agriculture, food security and climate change policies in Uganda

Institution	Policies	Status
Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) - Livestock Subsector	<ul style="list-style-type: none"> • Meat Policy - 2003 • Hides, Skins and Leather Industry policy • Animal Feeds Policy • Range Land Policy • Animal Disease Control Policy • Veterinary Drugs Policy • Delivery of Veterinary Services Policy • Animal Breeding Policy • Honey Production Policy 	<ul style="list-style-type: none"> • Approved • Draft • Approved • Draft • Approved • Approved • Approved • Approved • Approved
Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) - Crop Subsector	<ul style="list-style-type: none"> • Food and Nutrition Policy • Organic Agriculture Policy • National Agriculture Policy • Water for Agricultural Production Policy • Coffee Policy • Tea Policy • Vegetable Oil Development Policy • Urban Agriculture Policy • Cocoa Policy • Seed Policy • Irish Potato Policy 	<ul style="list-style-type: none"> • Approved • Draft • Draft • Draft • Draft • Draft • Draft • Draft • Draft • Draft • Draft
Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) - Fisheries Subsector	<ul style="list-style-type: none"> • Fisheries Policy 	<ul style="list-style-type: none"> • Approved
National Agricultural Research Organization (NARO)	<ul style="list-style-type: none"> • National Agricultural Research Policy 	<ul style="list-style-type: none"> • Approved
Ministry of Water and Environment (MWE)	<ul style="list-style-type: none"> • Forestry policy • Water policy 	<ul style="list-style-type: none"> • Approved • Approved
Office of the Prime Minister	<ul style="list-style-type: none"> • Disaster management policy • Resettlement policy 	<ul style="list-style-type: none"> • Approved • Approved
Ministry of Lands	<ul style="list-style-type: none"> • Land use policy 	<ul style="list-style-type: none"> • Approved

Source: Authors compilation

In recognizing the challenges posed by climate change to the economy and wellbeing of its people, the government of Uganda has outlined some objectives in its recent National Development Plan (NDP 2010/11-2014/15) to address climate change. These objectives include developing national capacity for coordination and implementation of climate change adaptation and mitigation activities to support social welfare and national development, ensuring climate proof development planning, promoting low carbon economic development pathway, and meeting international climate change obligations.

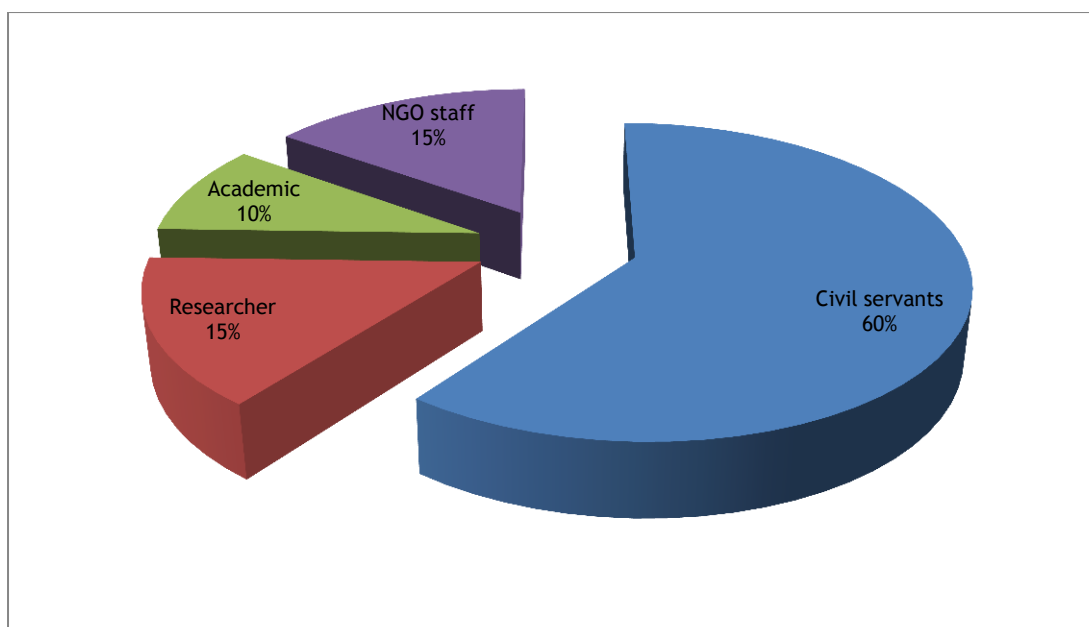
Concerted effort to tackle climate change in Uganda is still at an early stage. Currently, the government does not have a climate change policy and strategy in place that can guide climate change activities in the country. The government submitted the Initial National Communication to UNFCCC in October 2002, coordinated by the Department of Meteorology within the MWE (the national climate change focal point in Uganda). The national communication relied heavily on the results of previous studies such as the inventory of sources and sinks of greenhouse gases in Uganda (funded by GEF), and the assessment of vulnerability and adaptation to climate change, as well as adaptation and mitigation options (funded by the US government under US Country Studies Programme, 1995/96).

Uganda submitted its NAPA to UNFCCC in 2007. In preparing the NAPA, the need for Uganda to achieve the Millennium Development Goals and the country's development objectives as outlined in the Poverty Eradication Action Plan (2004) were considered. The NAPA identified nine priority projects to be implemented, but with limited progress due to lack of funds, inadequate capacity to prepare detailed proposals and mobilizing funds from international community and donor agencies.

5. Institutional capacity needs assessment

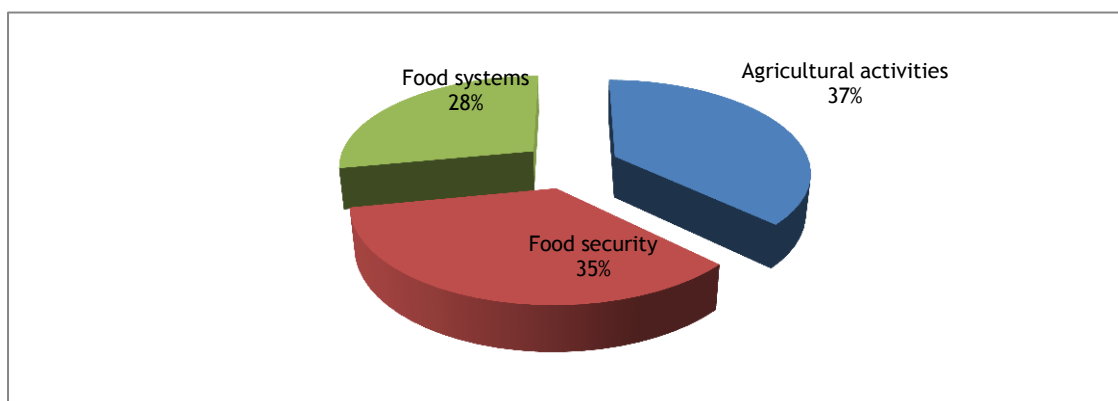
As discussed previously, 53 respondents from 50 institutions working on agricultural related issues in East Africa were interviewed. As expected, close to two-thirds of the institutions surveyed were government agencies while only 19 percent were civil society organizations (Figure 1). The key activities undertaken by these institutions include policy development (42%), research (36%), service (17%) and other activities (5%) in decreasing order of importance. About 60% of the respondents across the four countries were civil servants from various government agencies (Figure 6). Other respondents interviewed were either NGO staff or researchers with international institutions (15% in each case), while the remaining 10% of the respondents were from academic institutions.

Figure 6. Distribution of the respondents



The institutions interviewed were involved in some agriculture related activities with distinct differences in the key activities undertaken. Of the institutions interviewed, 37% were involved in agricultural activities, 35% were involved in food security-related activities (Figure 7). Another 28% of the institutions were involved in food system activities including food trade. Interestingly, about 20% of the institutions reported to have been involved in all the three activities considered in the survey. These trends point to a likely duplication of activities across the institutions in the region.

Figure 7. Institutional involvement in policy



A clearer picture of the duplication of efforts emerges when the policy areas of specialization are analysed for each institution. Over 60% of all the institutions reported to be formulating

policies related to the eight policy areas outlined in Table 6. However, the 53 respondents interviewed across the four countries were drawn from 15 institutions (Table 6).

Table 6. Policy areas of specialization

Policy area	Percent of institutions
Agricultural research and development	83
Climate and weather data	80
Plant and animal genetic resources improvement	80
Land management	73
Agricultural markets	73
Livelihoods security	73
Water management	67
Financial markets	60
N	15

Source: Authors compilation

A closer analysis of the types of plant and genetic resources improvement and utilization policies undertaken by the institutions is summarized in Table 7. About 60% of the institutions were involved either in the development and adoption of crop or animal productivity enhancing practices or in the strengthening of research to develop crop or animal genotypes that are more adapted to a wide range of target environments (Table 7). However, a lower proportion of the institutions surveyed were involved in the dissemination of research findings, livelihood diversification and the strengthening of seed systems (Table 7).

Table 7. Plant and animal genetic resources improvement and utilization policies

Policy area	Percent of institutions
Development and adoption of crop and animal productivity enhancing management practices	60
Strengthening research to develop crop and/or animal genotypes more adapted to a wide range of target environments	60
Strengthening dissemination of research findings on suitable crop and/or animal genotypes and management practices	53
Crop and livelihood diversification	53
Strengthening of seed systems to increase farmers' access to suitable crop genotypes	40
N	15

Source: Authors compilation

About 73% of the 15 institutions involved in land management and soil productivity improvement policies were undertaking activities that increase investment in research and extension work on soil and land management (Table 8). In contrast, 45% of the institutions were engaged in integrated nutrient management activities.

Table 8. Land management and soil productivity improvement policies

Policy area	Percent of institutions
Increasing investment in research and extension on soil and land management	73
Adoption of land management practices such as soil conservation to reduce land degradation	67
Improving infrastructure for organic and inorganic fertilizer supplies	55
Streamlining landownership rights to encourage farmers to invest in long term soil conservation and soil fertility management practices	53
Improving soil health and quality through practices such as integrated nutrient management	45
N	15

Source: Authors compilation

The three most important water management policies included enhancing stakeholder participation in water development and climate change adaptation; enhancing water availability through better use of groundwater storage, enhancing groundwater recharge and increasing surface water storage; and improving human resource, capacity and developing skills of policy makers and end-users as reported by 72% of the institutions surveyed in each case (Table 9). However, the development of long-term water policies scored poorly as only 39% of the institutions interviewed reported engaging in this activity.

In strengthening agricultural research and development, majority of the institutions surveyed were involved in activities that improve access to information (Table 10). This was followed by establishing collaboration with other industry stakeholders (67%), while little emphasis was on development and maintenance of research infrastructure as reported by 44% of the respondents.

Table 9. Water management policies

Policy area	Percent of institutions
Enhancing water availability through better use of groundwater storage, enhancing groundwater recharge and increasing surface water storage	72
Enhancing stakeholder participation in water development and climate change adaptation	72
Improve human resource, capacity and developing skills of policy makers and end-users	72
Initiating institutional and governance reforms	67
Improve information and early warning systems	67
Improved watershed and resource management	67
Increasing water productivity by promoting efficient irrigation and drainage systems	61
Developing long-term water policies and related strategies	39
N	15

Source: Authors compilation

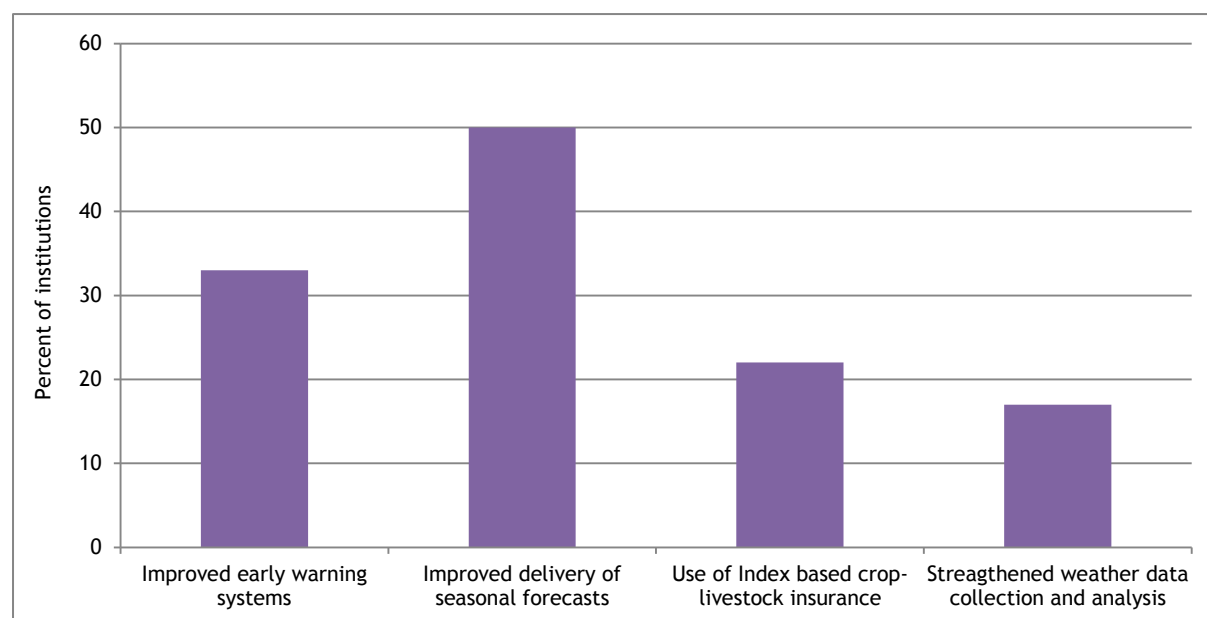
Table 10. Strengthening agricultural research and extension programs

Policy area	Percent of institutions
Improving access to information	72
Establishing collaboration with farmers, input suppliers, traders, industry and consumer groups	67
Establishing research partnerships with national and international research organizations	50
Increasing investment in training, recruiting and retaining research scientists and extension experts	50
Establishing and maintaining research infrastructure	44
N	15

Source: Authors compilation

The most important activity related to climate and weather information undertaken by the institutions surveyed was improving the delivery of seasonal forecasts as reported by about half of the institutions surveyed (Figure 8). This was closely followed by activities related to improved early warning systems. However, promoting of index based crop-livestock insurance and strengthening the collection and analysis of weather data were undertaken by less than 20% of the institutions surveyed (Figure 8).

Figure 8. Climate and weather information



Among the institutions undertaking development of agricultural input markets, only 6% were engaged in improvement and maintenance of market infrastructure (Table 11). In contrast, the key activity among institutions involved in strengthening agricultural input markets was linking farmers to markets as reported by 56% of the institutions (Table 11).

Table 11. Developing and strengthening of agricultural input and output markets

Policy Area	Percent of institutions
Linking farmers to markets	56
Improving farmer's access to production inputs (e.g. improved seed and fertilizers)	50
Improving crop produce handling, processing, and storage facilities	39
Incentivizing farmers and private sector to invest in farm produce processing and value addition	39
Improving infrastructure through maintaining and expanding rural and urban road density networks to increase access to input and output markets, and to reduce transaction costs	6
N	15

Source: Authors compilation

While 60% of the institutions surveyed reported to be involved in financial policies, only 35% were actively involved in improving farmers' access to credit (Figure 9). On the other hand, institutions involved in livelihoods improvement policies were mainly engaged in livelihood diversification (Figure 10).

Figure 9. Enabling financial environment

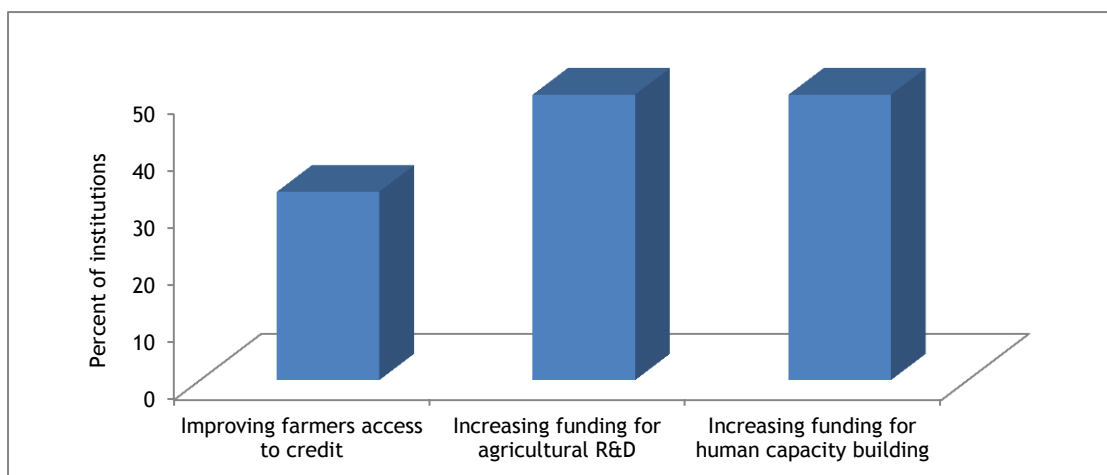
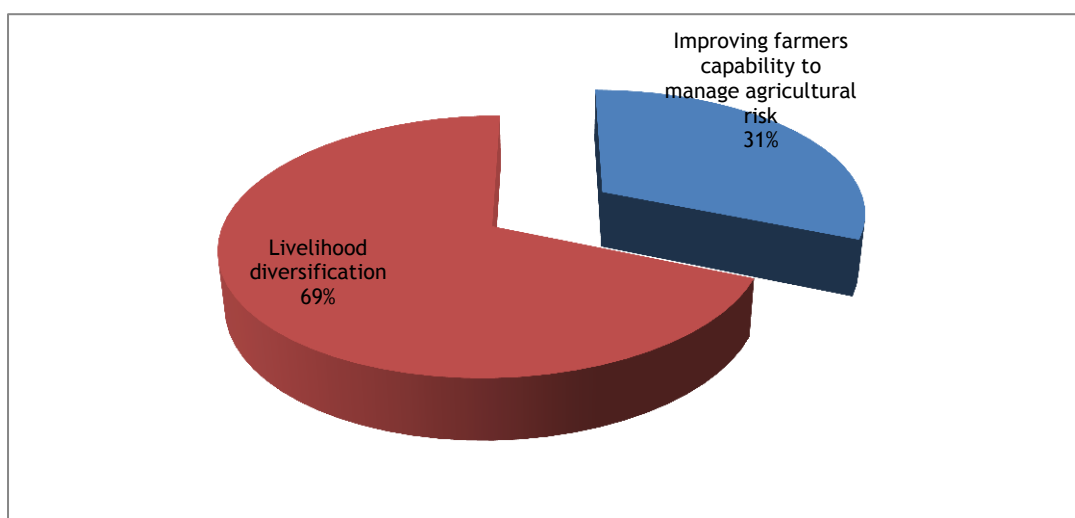
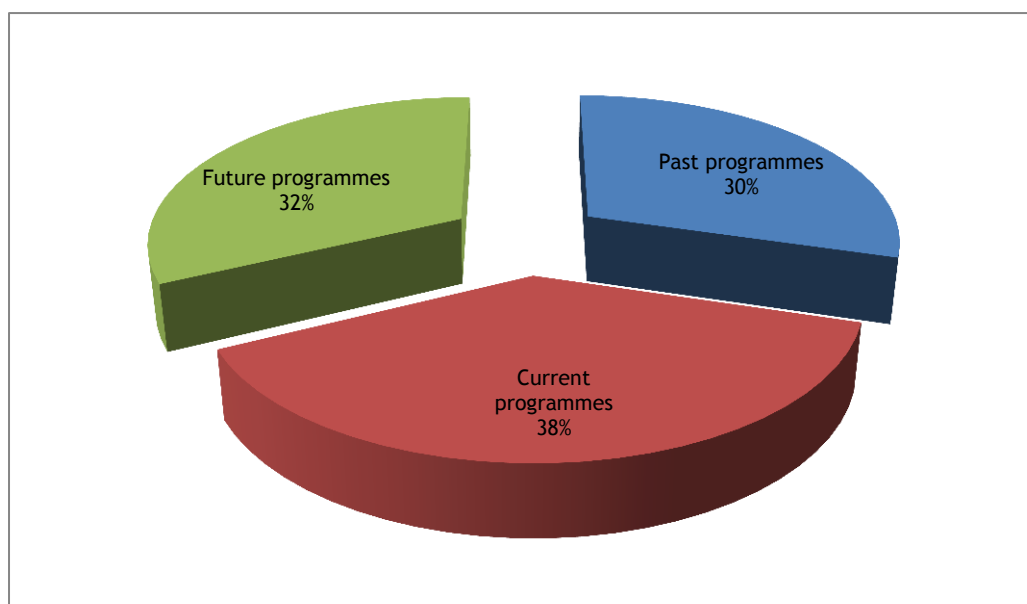


Figure 10. Livelihood security



There was overwhelming evidence of the contribution of projects in shaping the policies undertaken by the institutions across the region. Current projects were reported to shape the policies formulated by 38% of the institutions (Figure 11). Contribution of past programs in shaping the policies, however, seemed to diminish when compared with future programs as reported by 32% of the institutions across the region.

Figure 11. Influence of projects on policy formulation



On average, the institutions reported to have three main ongoing projects that had a major influence on their policy. The most common climate change-related projects were on mitigation, specifically REDD+. Moreover, 70% of the institutions had made achievements in implementing climate change adaptation projects. Indeed, almost all institutions undertaking some climate change related projects reported to have achieved some outputs. However, over 90% of the institutions reported facing challenges in implementing climate change and related agricultural policies. Main challenges in implementation across the region are summarized in Table 12. Overall, 62% of the institutions faced technical capacity challenges in implementing adaptation projects, 21% faced program funding limitations, 6% faced infrastructure limitations, while 11% reported facing other challenges. The occurrence of these challenges across the four countries followed similar trends to those observed for the region.

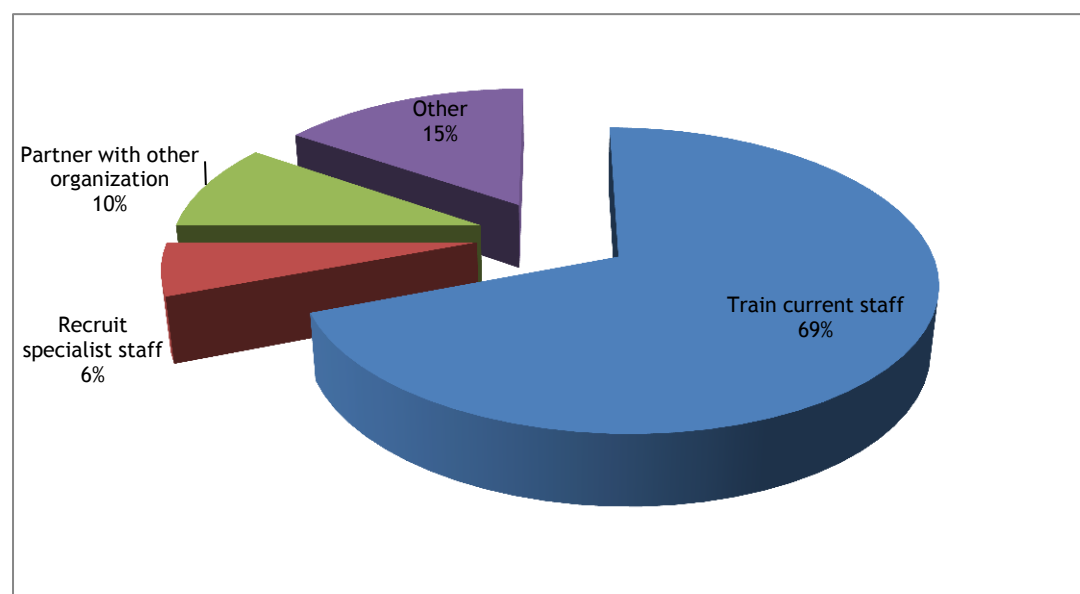
Table 12. Challenges to implementation of climate change policies in EA

Challenge	Percent of institutions
Lack of technical capacity	62
Program financing limitations	21
Infrastructure limitations	6
Other limitations	11
N	53

Source: Authors compilation

In response to the technical challenges, institutions in the region opt to re-train current staff as reported by 69% of the institutions (Figure 12). Other common strategies for addressing the challenges included partnering with other organizations with capacity (10%) and recruiting specialist staff as reported by 6% of the institutions. In response to funding challenges, the institutions often seek grants from development partners.

Figure 12. Responses to technical challenges



In response to infrastructure challenges, the most important strategy adopted by the institutions was to partner with organizations that had more developed infrastructure as indicated by 42% of the respondents (Figure 13). The next important response to infrastructure challenges was to build or purchase the requisite infrastructure while only 24% of the institutions preferred to lobby their national governments to build new or improve existing infrastructure.

As a response to programme financing challenges, 79% of the institutions opted to seek grants while only 11% either acquire credit or issue of rights bonds to raise finances (Figure 14). This perhaps illustrates the tendency of government institutions to rely on donors to fund their programs.

Figure 13. Responses to infrastructure challenges

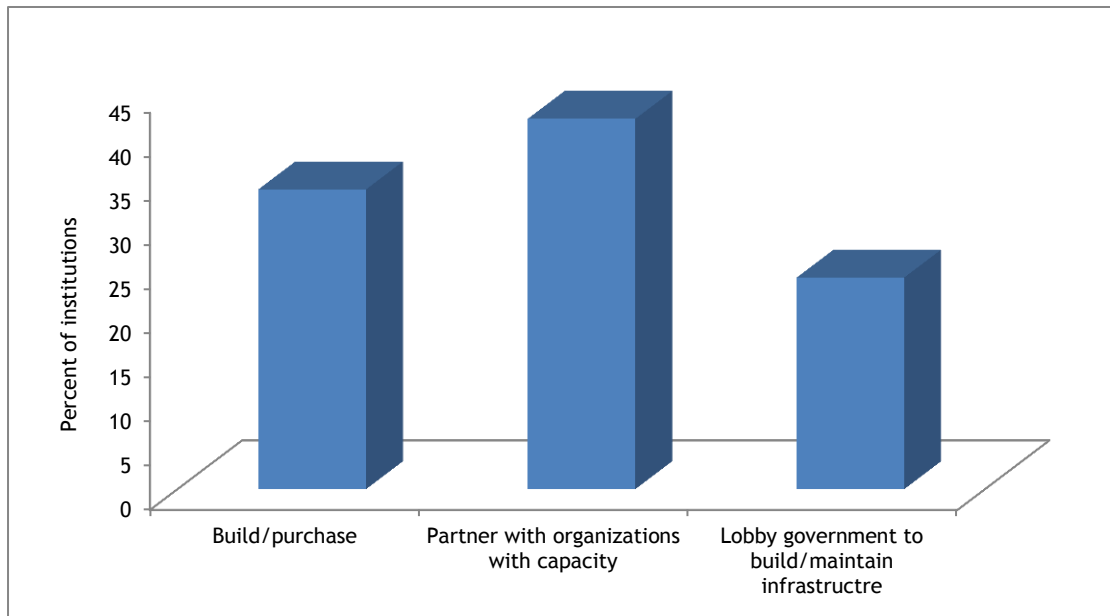
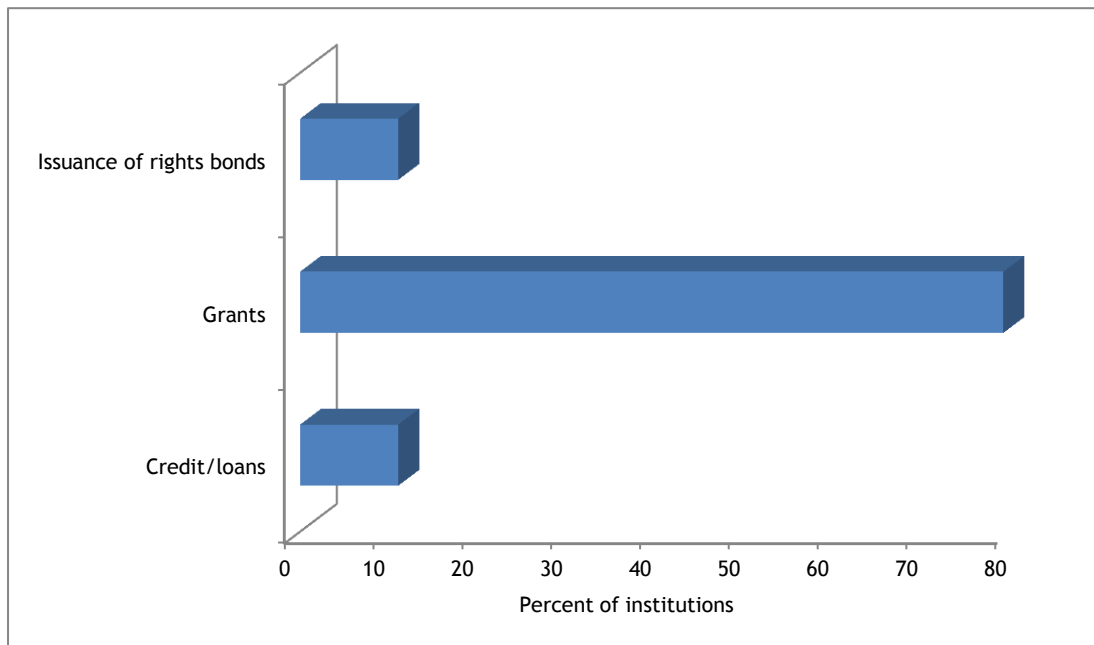
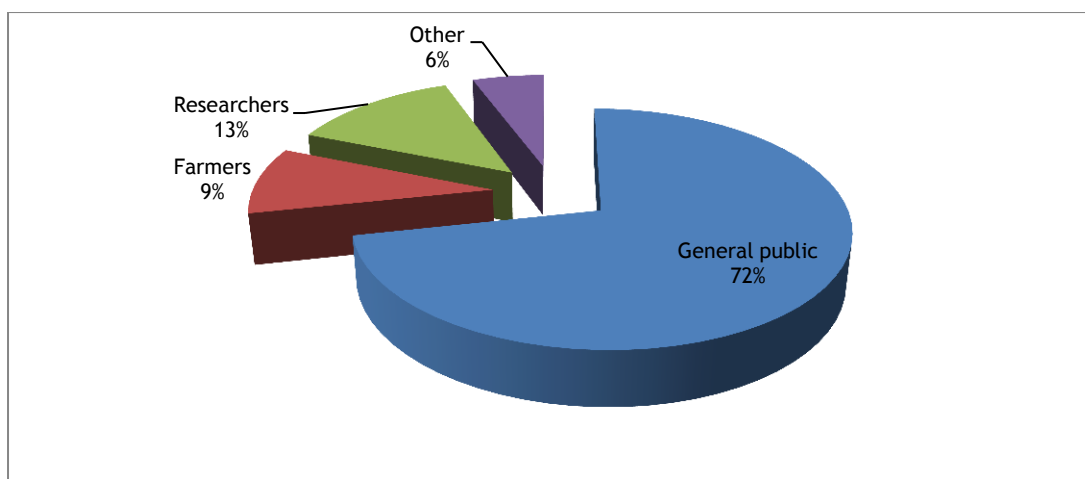


Figure 14. Responses to financing challenges



Almost all the institutions surveyed disseminated their research outputs. Their target audiences in decreasing order of importance were the general public (72%), researchers (13%), farmers (9%) and others as (6%) (Figure 15). A number of dissemination pathways were used and included the print, electronic and audiovisual media.

Figure 15. Target audience for information dissemination



As would be expected, electronic dissemination pathways such as electronic journals, email groups and the internet have become the most preferred dissemination methods as opposed to traditional methods such as publications in libraries. Dissemination through conferences and institutional meetings all accounting for 17% of all dissemination pathways reported (Table 13), closely followed by internet accounting for 16%. Discussions with colleagues and/or intra-institutional dissemination methods were used by about 13% of the institutions while the traditional posting of publications in libraries was used by only 10% of the institutions (Table 13).

Table 13. Dissemination pathways for research outputs in EA

Dissemination Pathway	Percent
Conferences	17
Internet	16
Intra-institutional	13
Newsletters	12
Libraries	11
Email groups	11
Broadcast media	10
Journals	9
Other	2
N	189

Source: Authors compilation

6. Conclusions

In East Africa, a number of institutions are actively involved in formulating climate change strategies and policies. These institutions include government actors, non-government actors (NGO, research institutions and civil society) and development partners (donor agencies). Government agencies, however, still dominate agriculture and climate change related policy making efforts in the region. These institutions have been responsible for formulating policies on agriculture, environment, forestry, wildlife, water, land and other climate change related policies. Most of the policies lean more towards environmental management, yet climate change is an issue that is beyond environmental management. Majority of the institutions interviewed had made achievements in implementing climate change adaptation and mitigation projects.

Across the four countries, the institutions faced various challenges in implementing agriculture and climate change related policies. The challenges include limited technical capacity in implementing adaptation projects, program funding and infrastructure limitations among other challenges. There were similarities in the occurrence of the challenges across the four countries. The preferred responses to the challenges related to technical capacity included retraining of existing staff and recruitment of specialized staff. To address the financing and infrastructure constraints, the institutions sought grants and lobbied their respective governments. There are also efforts to improve national coordination of climate change issues in the region, where climate change coordination units have been set up in each of the countries.

These findings give credence to calls for increased funding for climate change adaptation and mitigation in East Africa. Other policy recommendations include increased investment in human capital development to enhance policy formulation and implementation, investment in agricultural infrastructure and markets and collaboration between national and international institutions to enhance the capacities of the national institutions.

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