
# REGIONAL REPORT

Analyzing and Prioritising the Climate Change-related Capacities and Needs of Sub National Extension Actors in Ethiopia, Kenya and Uganda

*Prepared by:*

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# CONTENT

# EXECUTIVE SUMMARY

Agriculture has been recognized as an important sector for development in East African region. In the context of the Sustainable Development Goals (SDGs), resilience is crucial to their achievement with a number of goals and indicators focusing on improving resilience of individuals, households, communities and nations. These include SDG2 on Ending Hunger for which target 2.4 indicates the need to "ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen capacity for adaptation to extreme weather and associated disasters, progressively improve land and soil quality"; and SDG13 for which target 13.1 is specifically to "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries". The Agricultural Climate Resilience Enhancement Initiative (ACREI) is a 3-year partnership program between the World Meteorological Organization (WMO), the Food and Agriculture Organization of the United Nations (FAO) and the IGAD Climate Prediction and Applications Center (ICPAC) funded by the Adaptation Fund.

As a response to climate change impacts, building the capacity of extension actors at individual and institutional level, and assessing the enabling environment for response to climate change is critical. This assessment analyzes and prioritizes climate change-related capacities and needs of sub national extension actors in Ethiopia, Kenya and Uganda. The assessment used the FAO capacity assessment and development guidelines at local level (FAO 2015a). Under this guideline capacity assessed is under three dimensions of enabling environment, organization and individual capacities.

Enabling Environment dimension: Climate resilient agricultural extension can be highly impacted by the institutional set up at national and sub-national level. It includes things such as implicit and explicit rules, power structures, as well as the policy and legal environment in which individuals and organizations function. In terms of the Organizational dimension: This includes public and private organizations, civil society and networks of organizations. It addresses: performance of organizations; cross-sectoral, multi-stakeholder horizontal and vertical coordination and collaboration mechanisms; strategic management functions, structures and relationships; information, knowledge-sharing and decision-making processes. The individual dimension looks at: Involvement in climate change activities; Knowledge on climate change; and Individual challenges in climate change mainstreaming.

Despite a number of initiatives implemented in the three countries of this assessment, generally, there are no specific policies on integrating climate change in agricultural extension. Where climate change and agriculture policies exist as broader national policies, their implementation is elusive due to lack of awareness and financial support. Further, there is duplication with less coordination and networking amongst various organisations and stakeholders. There are limited climate change knowledge management systems and the extension agents themselves often lack the capacity to internalize the information, the communication tools for disseminating it and the resources for implementation.

# 1.0 INTRODUCTION

## 1.1 Overview of Agriculture and Climate Change in East Africa

Agriculture has been recognized as an important sector for development in East African region. According to targets 2.3 and 2.4 of the Sustainable Development Goals (SDGs) there is need for doubling of agricultural productivity, incomes of small scale producers, ensuring sustainable food production systems and implementing resilient agricultural practices that increase productivity and production (Kilic et al., 2017). The small scale farmers dominate agricultural production in the region (Reidsma et al., 2010; Mubaya et al., 2012; Waithaka et al, 2013; MAFSC, 2015; MAAIF Uganda CSA program 2015-2025). However, because of their high reliance on nature and subsistence rain-fed agriculture for livelihoods, they are often vulnerable to weather variability, climate hazards and climate change effects.

In East Africa, weather and climate have become more variable. For example, there has been an increased fluctuation in rainfall, with more extreme events induced by changes in temperature. For example, flooding has recently become common and, severe drought conditions leading to heat waves and water stresses have been reported in various parts of the region (Rahmstorf and Coumou, 2011). These adverse conditions have caused animal death, high levels of famine and reduced income levels for many people (Sivakumar, 2005). The arid and semi-arid lands in east Africa are the most affected areas with severe manifestations of weather and intra-seasonal variability (Egeru et al., 2014). In other parts of the region, climate change is fast being felt through increased variability, which is impacting on spatial distributions, and extreme weather events (Thornton et al., 2014).

According to WMO (2020), the year 2019 was among the top three warmest on record since at least 1950 over Africa. While drought is often a characteristic of climate change in the region, late 2019 experienced high rainfall in east Africa, attributed to one of the strongest positive Indian Ocean Dipole (IOD) events since reliable records began around 1960. This caused a late withdrawal of the south-west Indian monsoon, ultimately resulting in the devastating and widespread floods seen over much of eastern Africa in late 2019. Although the above normal rains did impact positively on crop production in many parts, the associated flooding resulted in loss of life, displacement, damage to crops and livestock deaths, including in south-eastern Ethiopia, and northern and eastern Kenya. In fact, the food security situation deteriorated markedly in 2019 in some countries of the Greater Horn of Africa due to climate extremes, displacement, conflict and violence. The Africa Regional Overview of Food Security and Nutrition (FAO and ECA, 2019) indicates the need for greater urgency in addressing climate resilience and climate change adaptation with an estimated 132 million people in eastern Africa or 31.4 % of the region's population being food insecure (undernourished) as of 2017 largely as a result of climate-related hazards, which have become a feature of the region.

The high correlation between agriculture outputs and climate variability, necessitates a response to climate change through adaptation and mitigation strategies by all actors including the farmers themselves, policy makers, development practitioners and extension agents. The small holder farmers are using a number of responses to try to adapt to seasonal manifestations of climate change including enhanced storage of food; digging of drainage channels; tree planting and planting of drought tolerant, disease; and pest-resistant varieties; early planting among others have been used as some adaptation mechanisms (Okonya et al., 2013; Antwi-Agyei et al., 2014). However, climate change adaptation and climate resilience continues to be eluding the small holder farmers partly due to limited advise, information and knowledge on cost effective applicable adaptation measures.

As a response to climate change impacts, building the capacity of extension actors (both individual and institutions), assessing and improving the enabling environment for response to climate change is critical. The Agricultural Climate Resilience Enhancement Initiative (ACREI) is one of the programs contributing to smallholder climate resilience, climate change adaptation and mitigation. This assessment analyzes and prioritises the climate change-related capacities and needs of sub national extension actors in Ethiopia, Kenya and Uganda.

## 1.2 The Agricultural Climate Resilience Enhancement Initiative

The Agricultural Climate Resilience Enhancement Initiative (ACREI) is a 3-year partnership program between the World Meteorological Organization (WMO), the Food and Agriculture Organization of the United Nations (FAO) and the IGAD Climate Prediction and Applications Center (ICPAC) funded by the Adaptation Fund. The program targets Ethiopia, Kenya and Uganda supporting community adaption practice, climate proofing of extension systems and climate informed decision making. The ACREI project is the first approved regional project, funded under the Adaptation Funds Pilot Programme for Regional Projects and is an innovative initiative linking regional and national level climate services capacity to local level adaptation and resilience for smallholder farming communities.

**The ACREI project is guided by the overall goal of** "developing and implementing adaptation strategies and measures that will strengthen the resilience of vulnerable smallholder farmers, agro pastoralists and pastoralists to climate changes and variability" and an objective of "Improved adaptive capacity and resilience to current climate variability and change among targeted farmers, agro pastoralists and pastoralist communities".

## 1.3 Context of ACREI Project capacity assessment

Within the framework of the ACREI project, The African Forum for Agricultural Advisory Services (AFAAS) was engaged to conduct an assessment on analyzing and prioritizing the climate change related capacity needs of extension actors at sub-national level.

**The assignment comprised mainly two major activities:**

**i)** Conducting stakeholder mapping and capacity needs assessment on integration of climate change in extension programmes at sub-national level. Thematic assessments related to identification of extension actors and the level of integration of climate change in agricultural extension in the target communities as well as the gaps, needs and opportunities.

This involved;

- Stakeholder mapping with a focus on identifying extension actors providing services within the target communities
- Assessment of the coordination between different actors involved in climate change adaptation planning and extension service provision so as to understand the opportunities for harmonization of the climate related extension information they are providing
- Identification and analysis of the (technical, institutional and operational) barriers and bottlenecks as well as the opportunities to climate proofing the extension system
- A comprehensive review of the existing district level extension system including its future plans related to training of extension staff, district development plans, ordinances, planned budgets and byelaws with a focus on identifying opportunities for incorporation of climate and weather aspects

Understanding what integration of climate change in agricultural extension included aspects such as individual capacities and knowledge on climate change adaptation and specific climate change adaptation practices for agriculture; understanding institutional capacities and constraints in relation to use of modern more climate resilient farming methods; evaluating the policy context in relation to climate change extension capacity building; and even looking at issues related to investment in agricultural extension services in light of climate change impacts.

**ii)** Development of a capacity development plan to integrate climate change in extension programmes at sub-national level. Building on the stakeholder mapping and capacity needs assessment conducted under Output 1 above, a comprehensive capacity development plan for all extension actors that are providing agricultural advisory support in the target communities was developed and used as the basis for further actions not just under the ACREI project but also as a guide for broader capacity development initiatives related to mainstreaming climate information in agricultural extension across the three target countries.

# 2.0 CAPACITY ASSESSMENT METHODS

## 2.1 Geographical focus and assessment sites

The ACREI project targets Ethiopia, Kenya and Uganda, with selected sub-locations (counties, districts or zones) identified for adaptation activities. These include Isingiro district, Mieso west Harerghe and Kersa east Harergher zones in Ethiopia and Taita Taveta county in Kenya. In each country 10 communities and 20 farmer field school groups are targeted for direct support.

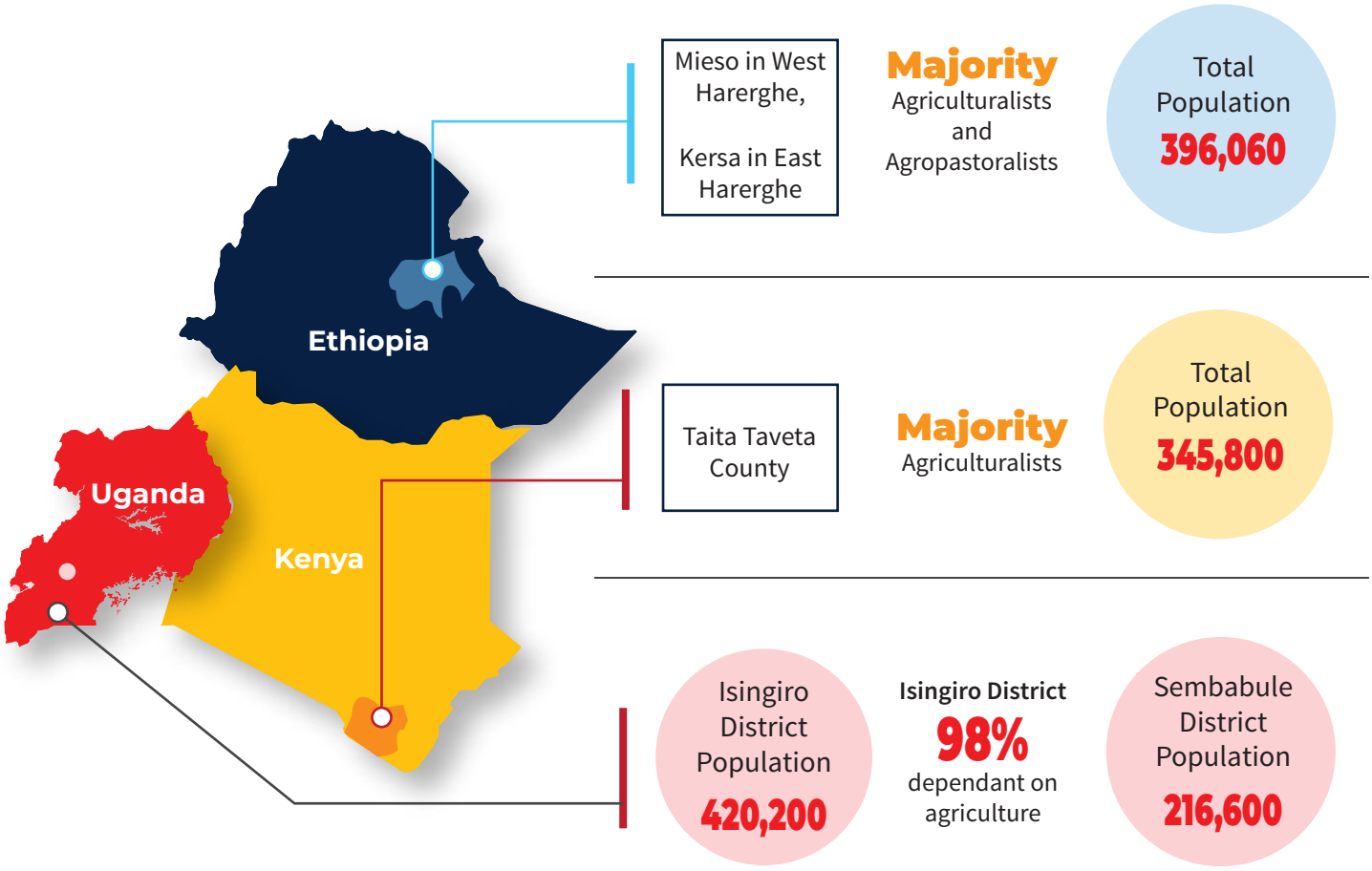



*Figure 1: Focus countries and research sites*

## 2.2 The contextual scope

This assessment was conceptualized in three dimensions of enabling environment, organizational and individual capacities. The dimension of enabling environment focuses on assessing the policy environment, legal frameworks, coordination mechanisms and gaps in the policy related to climate change and agriculture. The organizational capacities focused on assessing the level of operation of organizations, extension staffing in organizations, areas of focus of organizations in issues related to climate change, their levels of involvement in climate change, utilization of climate change information, and determinants of climate related information disseminated to the farmers. The individual dimension focused on assessing the involvement of CC activities, knowledge on CC, individual challenges in CC mainstreaming. All these three dimensions focused on improving the adaptive capacity and resilience to current climate variability and change among targeted farmers, agro pastoralists and pastoralist communities.

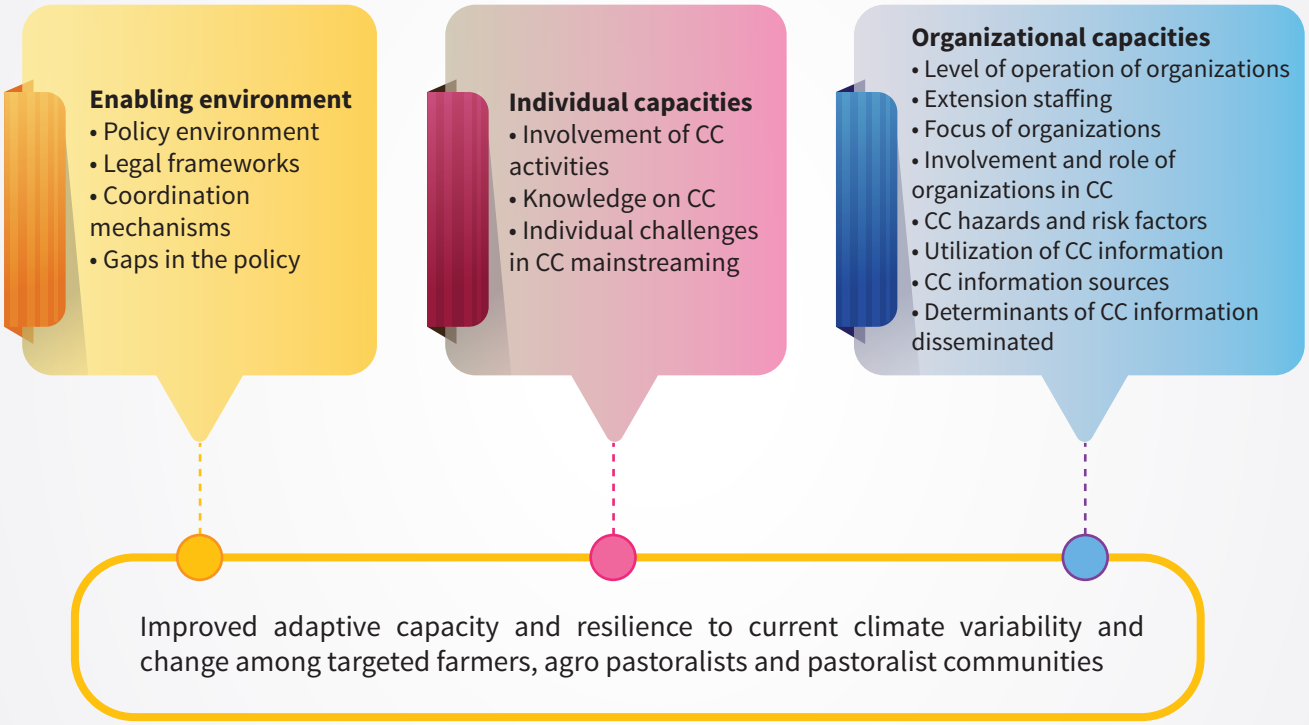



*Figure 2: Conceptual model*

This assessment used the FAO capacity assessment and development guidelines at local level (FAO 2015a). Under this guideline capacity assessed is measured under three dimensions namely: enabling environment; organizational capacities; and individual capacities.

**Enabling Environment dimension:**

Climate resilient agricultural extension can be highly impacted by the institutional set up at national and sub-national level in particular. It includes things such as implicit and explicit rules, power structures as well as the policy and legal environment in which individuals and organizations function. Therefore among the data collected under the enabling environment dimension include: existence of climate change and related policies, existence of agriculture extension policies and budget support for such policies. Data on the enabling environment was collected through literature review and key informant interviews (KIIs) with relevant departments and ministries.

**Organization dimension:**

This dimension includes public and private organizations, civil society and networks of organizations. It addresses issues related to performance of organizations; cross-sectoral, multi-stakeholder horizontal and vertical coordination and collaboration mechanisms; strategic management functions, structures and relationships; information, knowledge-sharing and decision-making processes. Under the organization dimension the study looked at things like: departments with the mandate for climate resilient agricultural extension, other non-government organizations involved in agricultural advisory services, collaborations and partnerships between different organizations, existence of knowledge and information exchange, mechanisms for knowledge and information exchange, climate smart agricultural practices among others. Such information was collected through key informant interviews with relevant departmental and organizational heads (see annex 1 for organizations reached for KIs)

**Individual dimension:**

This dimension refers to the technical and functional knowledge, skills, competence levels and attitudes of individuals. These was addressed through examination of facilitation, effective learning activities and competency development. In terms of climate smart agriculture; this dimension is important in developing targeted individual capacity strengthening efforts for farmers and extension professionals. Things like required and desired skills, and learning opportunities were captured under this dimension. Data was primarily collected through a survey (structured questionnaires and semi-structure) targeting agricultural extension agents (AEAS actors) and focus group discussions with farmers. A total of 120 AEAS actors (40 per country) were selected for the questionnaire survey. The respondents were identified from different institutions that have either and agriculture or climate change aspect in their programing. Furthermore, a total of 12 focus group discussions (4 per country) were conducted with farmers identified from different farmer groups

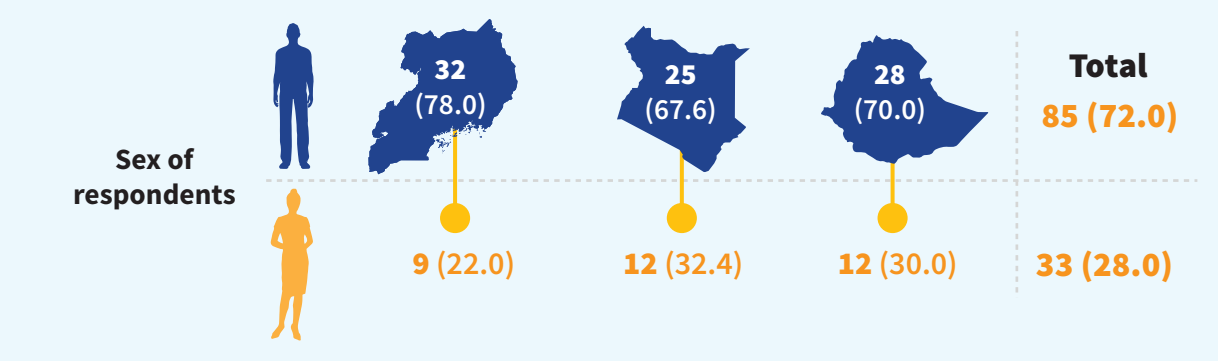
## 2.3 Data analysis

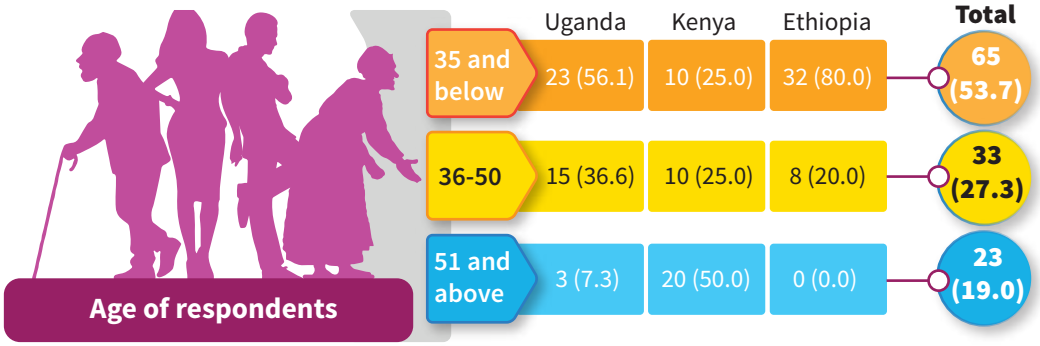
This data was analyzed using STATA (Version 15) statistical software for descriptive and quantitative analysis. Frequency, mean and standard deviation generated were presented in form of tables, graphs, and histograms. Secondary data was analyzed by reviewing country reports on the same subject and extracting the relevant information to build on this regional report.

# 3.0
# RESULTS AND DISCUSSION

## 3.1 Demographic characteristics of respondents

Figure 3 indicates different demographic features of the respondents. Females form a small proportion (28%) of extension agents in the project sites with Uganda recording the smallest percentage of only 22%. Given that women play a big role in agriculture in the project locations, it is necessary to recruit more into the agricultural advisory services. This is important because female extension officers understand the problems faced by women farmers more than male officers. The youth in the age range of 35 years and below form 50% of the extension officers in Ethiopia and Uganda. This is positive in that good as the youths can encourage fellow youths to join agriculture. However the youth officers require experienced colleagues in the field for lesson sharing. This is not the case for these two countries where it seems officers above 50 have been opting out of the profession. The case for Kenya is however different, where 50% of extension officers are more than 50 years old. This is worrying and gives a bleak future of extension upon the retirement of majority extension officers. It is important to blend the youth and experienced extension officers for smooth and continuous delivery of extension services. Across all the countries, slightly more than half of the respondents had attained degree level education and the majority have degrees and diplomas. It is worthy to note that the respondents in Ethiopia had only degree and diploma as their highest qualification.



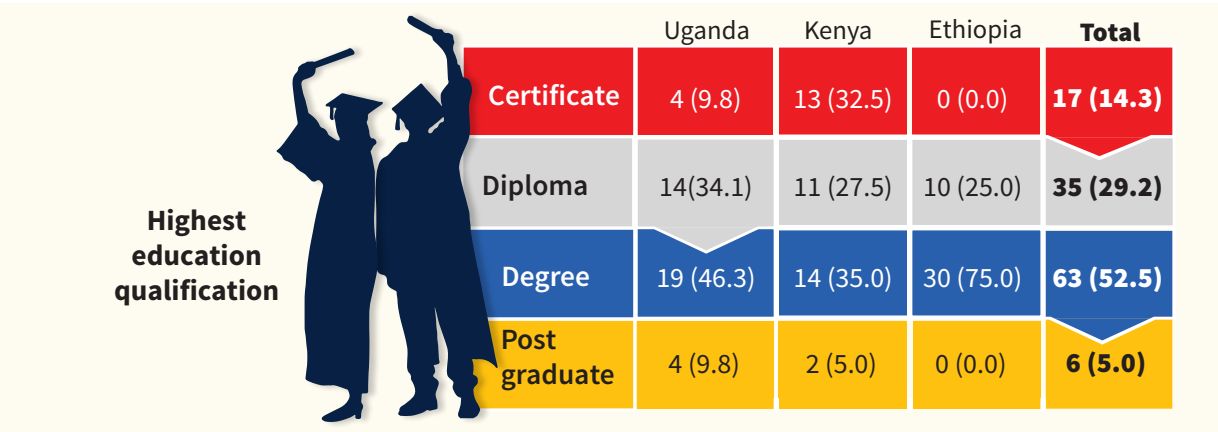




*Figure 3: Background characteristics of respondents*

## 3.2 Enabling Environment

In East Africa, a number of policies and programs have been put in place to address climate change related problems, challenges and vulnerabilities. However, the awareness of many policies and programs is generally very limited both among the extension agents, institutions implementing climate related issues and the farmers.

There is no documented evidence of legal frameworks in Uganda and Ethiopia regarding integration of climate change in agricultural extension. Where guidelines exist, they are not popularized and many stakeholders are not aware of their existence. Funds designated for mainstreaming climate change exist in all the three program countries (for example:

> *In Kenya, the National Drought Emergency Fund established in 2018 with an allocation of Ksh. 2 billion from the exchequer and seeks to finance climate related risks; In 2010, Contingency Fund was established to finance climate related unforeseen disasters; The National Environment Management Authority oversees two funds, that is, Green Climate Fund and Adaptation Fund. In Ethiopia; Climate Finance Adaptation (UNFCCC); Climate Finance Mitigation (UNFCCC); Climate Finance Cross-cutting (UNFCCC); Biodiversity (UNCBD all funded by Irish aid).*

However, it is very difficult to access the funds from the funding institutions. This is mainly due to: (a) absence of clearly defined mechanisms of accessing the funds (b) low commitment levels by fund implementing agencies and (c) poor coordination amongst different stakeholders. In addition, there is no specific definition of climate change priority areas to schedule funds to. The levels of collaboration between the private and public extension mechanism are very limited and inadequate especially in Uganda and Kenya. In Ethiopia, however, extension systems are public driven, with the private institutions and NGOs working on different areas of agriculture with very limited collaboration with the government institutions and public institutions. There is therefore need for government institutions to improve coordination and collaboration among themselves as well as with other actors in rural advisory services.

Looking at funding for agriculture, of the three countries under this study, only

**3.2%, 3.6%** and **6.9%**

of the national budgets in Kenya, Uganda and Ethiopia respectively are allocated to agriculture. Table 2 enlists the existing policies, legal frameworks and coordination mechanisms in the three countries.

*Table 2: Existing policies, legal frameworks and coordination mechanisms*

| Country | Existing policies, frameworks and mechanisms |
|---|---|
| Uganda | • The Uganda constitution provides that "The State shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for the present and future generations"<br><br>• The Uganda Vision 2040 illustrates Government commitment to develop appropriate adaptation and mitigation strategies on Climate Change to ensure that Uganda is sufficiently cushioned from any adverse impact brought by climate change<br><br>• The National Climate change policy (NCCP) ensures a harmonized approach towards a climate-resilient and low-carbon development path for sustainable development in Uganda<br><br>• The National Agricultural policy under objective 5 provides for Strengthening of the capacity for collection, analysis and dissemination of agricultural meteorological data at all levels; establishing more meteorological stations at strategic points around the Country; enactment and enforcement of ordinances and by-laws regarding utilization and management of agriculture resources; develop capacity for planning and budgeting processes at all levels to address climate change and its impact on agriculture among key actions<br><br>• The National Adaptation plan demonstrates "A climate resilient and sustainable agricultural sector contributing towards achievement of the Uganda Vision 2040" through reducing vulnerability and enhancing adaptive capacity of Uganda's agricultural sector to the impacts of climate change in order to achieve sustainable agricultural development."<br><br>• The National Agricultural extension policy with two objectives; i) establish a well-coordinated, harmonized pluralistic agricultural extension delivery system for increased efficiency and effectiveness; and ii) develop a sustainable mechanism for packaging and disseminating appropriate technologies to all categories of farmers and other beneficiaries in the agricultural sector<br><br>• The Uganda Meteorology policy act which provides for Establishment of UNMA whose functions include enabling rapid exchange of meteorological and related information; establishing a network of stations for collecting meteorological data; providing short, medium and long term weather forecasts; build capacity at local government level for the implementation of the climate and weather programs; and to promote the use of weather and climate services in development planning and build strategic partnerships with stakeholders.<br><br>• The national irrigation policy with a goal of ensuring sustainable availability of water for irrigation and its efficient use for enhanced crop production, productivity and profitability that will contribute to food security and wealth creation.<br><br>• Other complementary and related policies and strategic frameworks include: National Coffee Policy 2013, National Fisheries Policy (2003), Food and Nutrition Policy (2003), Draft Rangeland Policy, The Land policy; National Environment Management Policy (1995); Wetlands Policy (1995); Uganda Strategic Investment Framework for Sustainable Land Management 2010-2020; and Disaster Preparedness and Management Policy (2010). |

| Country | Existing policies, frameworks and mechanisms |
|---|---|
| Kenya | • National Agriculture Sector Extension Policy (2012) seeks to guide extension services provision. The policy envisions an extension clientele demanding and receiving quality extension services for the betterment of their livelihoods<br><br>• Climate Smart Agriculture Strategy of 2017 to 2022. The strategy seeks to enhance agriculture adaptive capacity and resilience. It also seeks to ensure agriculture results in reduced green-house gas emissions. It acknowledges Farmer Field School (FFS) as a participatory and effective way of transferring knowledge to and learn from agricultural communities<br><br>• The new agriculture strategy (2019) that seeks to ensure growth and transformation of the agriculture sector. The strategy recognizes the risks climate change poses to agriculture and among its key principles to transformation Kenyan agriculture is the need to enhance agriculture resilience to climate change shocks and risks<br><br>• Kenya National Adaptation Plan (KNAP) (2015-2030) which identifies agriculture as a sector negatively impacted on by climate change and the need to cushion agriculture sector players from climate hazards. Among priority short term actions include mainstreaming of climate change into agriculture extension<br><br>• National Climate Change Policy Framework as the overarching policy guiding climate change interventions in the country<br><br>• The Climate Finance Policy (2016) that aims at positioning Kenya to better access climate finance through a variety of mechanisms by designing strategic interventions that would encourage mobilization of climate finance and increase financial flows<br><br>• The NCCAP (2018-2022) which outlines actions towards enhancing adaptive capacity and resilience of the agriculture sector. The climate change action priority two of the NCCAP focuses on agriculture sector. The NCCAP is the framework developed to implement the National Climate Change Response Strategy (NCCRS) of 2010 which prioritizes amongst other things investment in water harvesting, early warning system, food storage facilities, and broader use of drought tolerant crops and promotion of conservation agriculture.<br><br>• National Disaster Risk Management Policy. The policy established National Disaster Management authority in 2011 as the institution mandated to coordinate drought mitigation, response and management<br><br>• National Drought Emergency Fund established in 2018 with an allocation of Ksh. 2 billion from the exchequer and seeks to finance climate related risks<br><br>• In 2010, Contingency Fund was established to finance climate related unforeseen disasters |

| Country | Existing policies, frameworks and mechanisms |
|---|---|
| Ethiopia | • Climate-Resilient Green Economy' (CRGE) strategy.<br>• National Adaptation Plan of Action (NAPA), which aligns climate change centered adaptation initiatives with ongoing development endeavors, to obtain synergies and achieve the outcomes of enhancing adaptive capacity of government, local institutions and individual women and men who are directly affected by climate change impacts on their livelihoods and the landscapes in which they live.<br>• Nationally Appropriate Mitigation Actions (NAMAs)<br>• Climate Resilience Strategy: Agriculture and Forestry (2015) which identified adaptation options in order to select the most promising programmatic options as well as appraised the options in terms of uncertainty and risk of future climate change in each sector.<br>• Intended Nationally Determined Contribution (INDC), 2015, which summarized short to long-term programmatic efforts to address reduce vulnerability of livelihoods and landscapes to climate impacts, focusing on three key areas: droughts, floods and cross-cutting interventions<br>• Environmental Policy (1997) which focuses on strengthening sustainable natural resources management through safeguarding landscapes and watersheds<br>• National Energy Policy (1994)<br>• Ethiopian Programme of Adaptation to Climate Change (2010) which outlined 20 prioritized climate change related impacts and the corresponding adaptation measures<br>• REDD+ strategy<br>• National Policy and Strategy on Disaster Risk management, 2013<br>• Climate Resilient Green Economy (CRGE) Strategy to underpin this ambition and to strengthen its capacity to adapt to the effects of climate change. Reducing vulnerability to climate change risks and shocks as well as increasing adaptive capacity<br>• Second Growth and Transformation Plan (GTP II) acknowledges that in the long term, if climate change is not tackled, growth itself will be at risk |

## 3.3 Gaps identified in existing policies

A number of policies, frameworks and mechanism listed in Table 3 have registered success in their implementation. However, across the three east African countries, some constraints and challenges still exist in fully realizing some of the policy objectives. For example, existing funds are inadequate to ensure wider coverage in promoting and implementing some of the policies. Furthermore, due to inadequate coordination among implementing institutions and actors, high levels of duplication have characterized the implementation of different initiatives.

*Table 3: Gaps identified in existing policies*

| | |
|---|---|
| **Uganda** | i) Guidelines for mainstreaming climate change in agricultural policies and plans are not popularized and adapted to local contexts<br><br>ii) Explicit structures and arrangements that ensure harmonization implementation, meaningful engagement of stakeholders and continuous improvement, monitoring, and reflection of legal frameworks at different levels are still missing<br><br>iii) There are gaps in enforcing legal frameworks especially at grassroots which undermines capacity to mobilize local resources and innovation for meaningful engagement and action<br><br>iv) Lack of specific funds designated to mainstreaming of climate change mainstreaming activities and out scaling at LG level<br><br>v) Lack of clear and generally agreed indicators for climate change mainstreaming compliance |
| **Kenya** | i) Mechanisms to support counties to contextualize the existing policies to their own county context which would facilitate their mainstreaming into County Sectorial, Integrated Development and Annual Development plans are still lacking<br><br>ii) The levels of awareness on the numerous policies governing agriculture sector and climate change remains low<br><br>iii) With policies closely related, and cutting across multiple ministries and agencies, the weak coordination structures between ministries makes implementation disjointed hence results are not realized<br><br>iv) The existing mechanisms for climate change coordination lacks representation of the non-state actors who are essential in policy discourse dialogue<br><br>v) Awareness of existence of funds and access remains a challenge |
| **Ethiopia** | i)The successive reforms and policy on agriculture and extension do not consider local content and initiative<br><br>ii) the existing policies are not properly integrated and implemented through the extension systems and actors<br><br>iii) The national development strategies and plans, sectoral strategies, and guidelines are not exhaustively analyzed for integration of climate change adaptation<br><br>iv) Current policies and frameworks do not clearly define the regular mainstreaming and incorporation of climate change adaption strategies in the context of agriculture at many government administration levels<br><br>v) Governance structures defined in some policies for example the CRGE does not exhaustively incorporate all coordinating, implementing, and executing entities, such as social sectors which have been involved in climate adaptation activities. |

## 3.4 Organizational Capacities

### 3.4.1 Stakeholder mapping

A number of organizations across the three countries had interventions related to climate change (Table 4). While the major areas of focus for the organization in the three countries were climate related, their areas of collaboration were also related to climate change and agriculture. From the assessment results, about 72% of the respondents in the region confirmed the presence of other organizations working on climate change related extension services within their locations. Over three quarters of the respondents in Uganda and Kenya confirmed the presence of organizations dealing in climate change extension services. In Ethiopia, however, only 35% of the respondents interviewed confirmed the presence of organizations providing climate change extension services within the country (see annex 2 for results). The following table lists the major collaborating institutions, their areas of focus and areas of collaboration

*Table 4: Collaborating organizations, areas of focus and collaboration*

| | Uganda | Kenya | Ethiopia |
|---|---|---|---|
| Organizations | SEDFA; JEEP; GCCA; ACREI; TECNOSERVE; USAID-Commodity Production and Marketing activity-project<br>Tree talk plus; District local government; COVOID; Kanywamaizi farmers' cooperative; ICOBI; Isingiro District Farmers Association (ISIDFA); Sasakawa G2; International lifeline fund<br>Rural Promotion and Alleviation Initiative; UNMA; NEMA; FAO; Café Africa; UNMA; Feed the future; MAAIF; Millennium Village Agent; Environmental alert; Plan International; Catholic Relief Society | MIRAN;KCEP- CRAL FAO; KFS; KCSAP ;Tumaini CBO; Livestock Dept; NDMA; MOAL; JAICA; ASDSP KSCAP; Dept. of Agri; Curch; World Vision; Redcross; ICRISAT; Mazido; KCEP; KARLO; ASDSP; KCEP; Dept. of Public Health; Davis Shirtliff; NDMS; Global Angels; NDM; SDSP; Nalep | FAO; ENMA; Oda Bultum university; Haramaya university; Zonal bureau of agricultural; Woreda agricultural offices; Regional bureau of agriculture; Moa; Research centre; CARE; CRS; Kebelle Farmers' organizations; Oda Blttom Farmers Cooperatives Union; FTC |
| Areas of focus | i) CCM measures (mitigation and adaptation)<br>ii) Input supply<br>iii) Promotion of sustainable coffee production<br>iv) Soil, water and land management<br>v) Training on sustainable farming practices<br>vi) Agroforestry (tree planting and distribution of seedlings)<br>vii)Excavation of dams<br>viii)Climate change adaptation<br>ix)Environment protection<br>x) Administration of district<br>xi) Provision of advisory services<br>xii) Increased food production<br>xiii) Capacity building of farmers<br>xiv) Weather forecast<br>xv) Environmental protection<br>xvi) CSA technology dissemination, | i) CSA technologies dissemination<br>ii) Training and awareness creation<br>iii) Disaster risk reduction<br>iv) Social support e.g housing, relief | i) Poverty reduction<br>ii) Capacity building,<br>iii) Watershed management<br>iv) Afforestation, |
| Areas of collaboration | ) Training and awareness creation<br>ii) Location of water sites.<br>iii) Funding,<br>iv) Mobilization and sensitization of farmers<br>v) Village Agent model<br>vi) Supply of tree seedlings,<br>vii) monitoring SEDFA projects<br>viii) Joint implementation of activities<br>ix) Sharing of technical knowledge, supply of inputs<br>x) Beneficiary identification<br>xi) Dissemination of information<br>xii) CSA technologies dissemination | i) CSA technologies dissemination<br>ii) Training and awareness creation<br>iii) Disaster risk reduction<br>iv) Social support e.g housing, relief | i) Safety net program<br>ii) Training of extension staff<br>iii) Supporting small holder farmers,<br>iv) Empowerment,<br>v) Capacity building<br>vi) Seedling production and distribution<br>vii) Farmer training |

### 3.4.2 Level of operation of organizations

The level of operation of organization reached varies across countries (Figure 4). The majority of the organization operate at local level (average 73.6%) with Uganda and Ethiopia have a relatively high number of organization operating at this level. Uganda (2.4%) had a relatively low participation of organization operating a regional level. About 12% of the organizations operate at regional level while approximately 14% operate at national level. Respondents identified from organizations operating at local level were mainly those employed by government institutions especially the district level administration units. These findings were expected since the study was based at local level

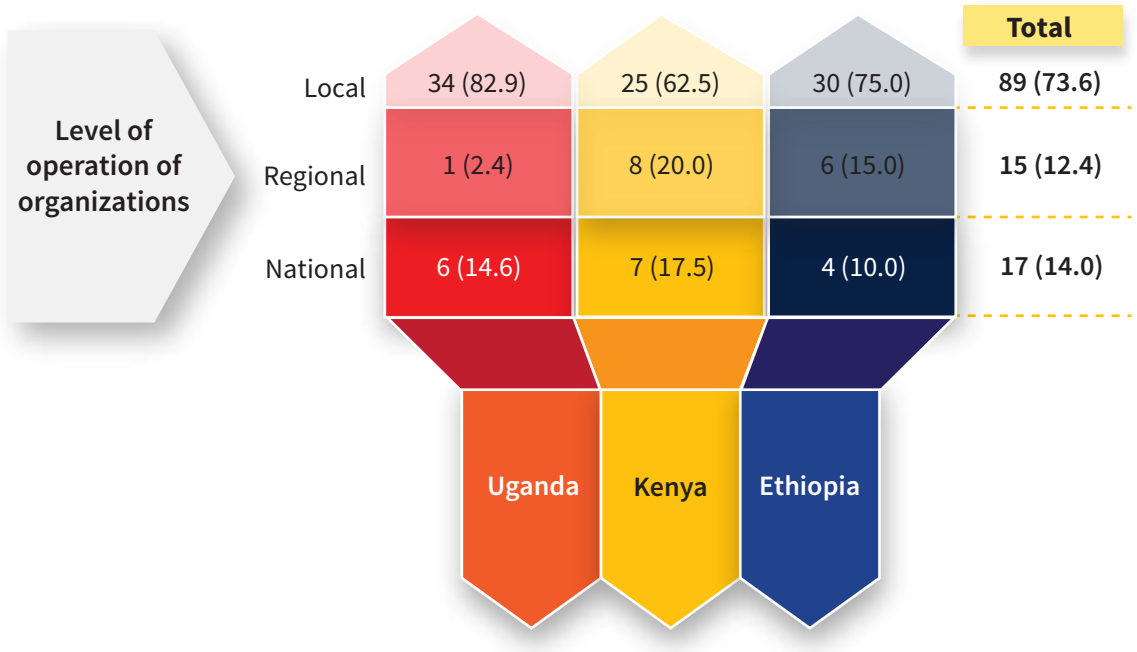



*Figure 4: Level of operation of organizations*

### 3.4.3 Focus of organizations

The institutions reached in all the three countries focused on different areas of agricultural service delivery (Figure 5). Most common in all the countries was a focus on agricultural production, productivity and food security; and extension and agricultural services. This was common for the local level institutions especially the local government departments. The provision of agricultural and advisory services was also common for the organizations in Uganda while organizations in Ethiopia and Kenya also focused on rural development interventions and livestock respectively. Very few of the organizations indicated a focus on climate change or issues of climate information, with only Ethiopia having organizations stating they were involved in these areas. Although in their focus on agricultural production, most of the organizations do in one way or another integrate or take into account issues to do with weather, climate and agro climatology. Further questions on involvement specifically in climate change related activities were asked in order to gain a better understanding of the level of integration of climate change in the work of these organizations.

The focus on production and food security, particularly in the context of climate change, necessitate an increasing need for value chain development, value addition and market linkages as a means of building resilience to climate change. In all countries assessed, this value chain focus stood out as a major gap in terms of integrating climate change in agricultural extension

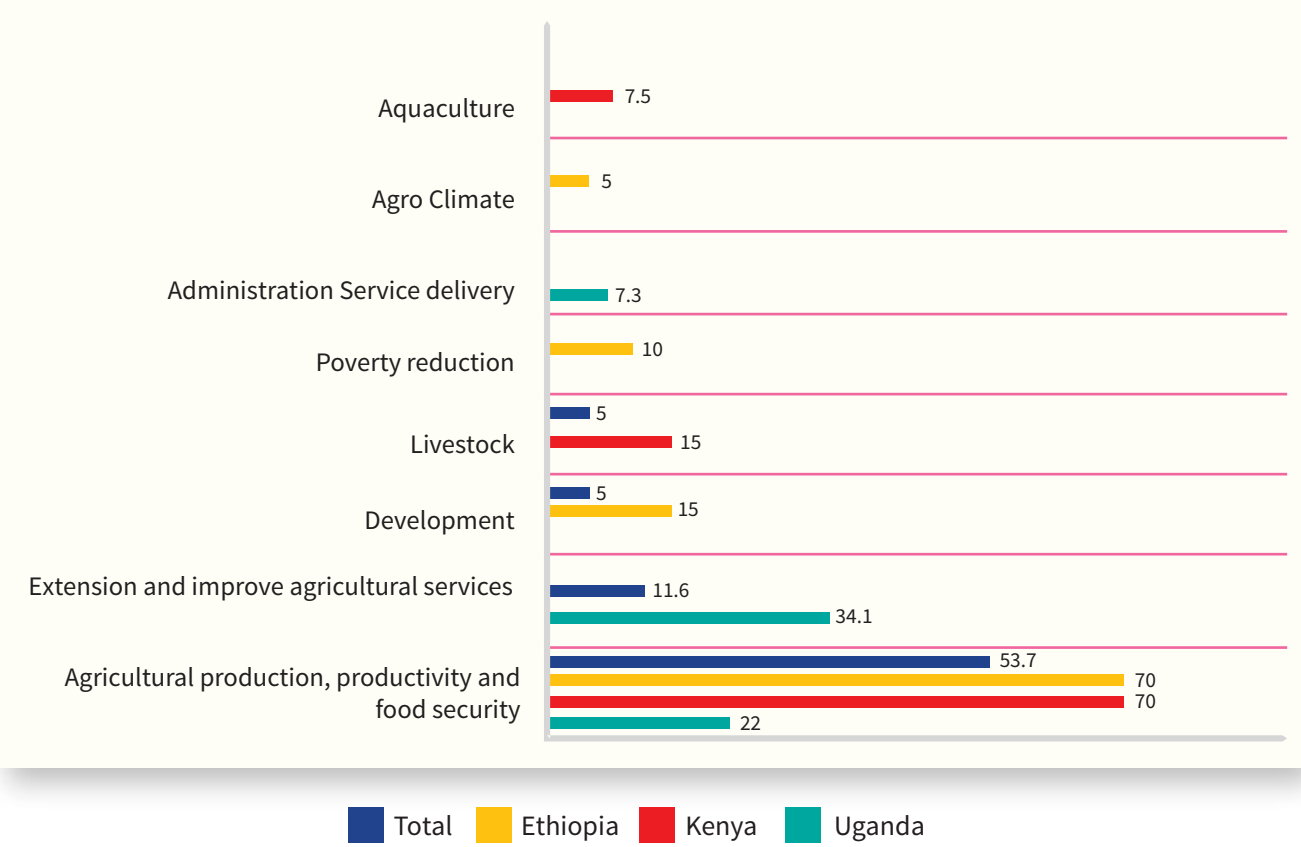



*Figure 5: Area of focus of organizations*

### 3.4.4 Number of technical staff

The number of technical extension staff varied across countries (Figure 6). Overall, an average of 16 technical staff was reported across the three countries of which an average of about 8 technical staff was engaged in agricultural extension. In Uganda, an average of 18 technical and 11 staff in extension was reported. In Ethiopia, an average of 20 technical staff and 7 staff in extension was reported. Kenya reported the lowest number of technical staff compared to other countries with only 9 technical and 5 staff in agricultural extension reported. Agriculture extension takes a big proportion of the technical staff at Sub-regional level across the three countries. Uganda has the biggest proportion with up to 60% of its technical staff being extension officers. This presents an opportunity where climate change information can be disseminated to farmers, if there is a supportive mechanism

However, the extension to farmer ration in target locations has remained low. The current ratio of extension worker to farmer is low compared to the recommended in the three countries (e.g. Barungi et al., 2016). Subsequently, a large number of smallholder farmers and other vulnerable groups remain unreached by the various public extension systems, and the fact that the private sector plays only a limited role. This is coupled with inadequate funding from the central government, the small number of private-public partnerships, limited synergies between projects and duplication of initiatives. Extension should go beyond technology transfer, facilitation, training, learning, and should include assisting in the formation of farmer groups, addressing marketing issues, and partnering with a broad range of service providers and other agencies (Davis, 2009).

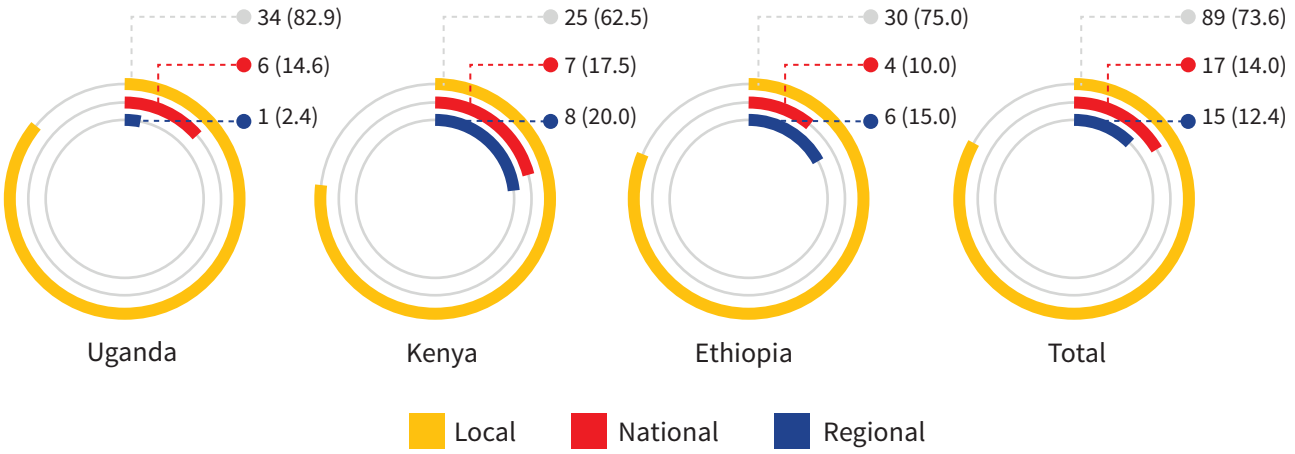



*Figure 6: Average number of technical staff*

### 3.4.5 Level of involvement of organization in climate change

The level of involvement of the organization in climate change activities varied depending on the level of operation of the organization (Figure 7). When asked broadly to judge their level of involvement on climate change issues, in Uganda, only close to half of the respondents (46%) reported that their organizations were highly involved in climate change issues. In Kenya on the other hand, the highest percentage (38%) was recorded by organizations which were only partially involved in climate change issues. Only about a quarter of the respondents reported that their organizations were fully involved. In Ethiopia, the majority of the respondents (85%) reported that their organizations were fully involved in climate change. This variance in organization involvement in climate change matters may be an indication of the levels of awareness raising and knowledge on what climate change activities encompass and the need for capacity building for climate change integration in agriculture.


*Figure 7: Level of involvement of organizations in CC in agriculture*

### 3.4.6 Role of the organizations in climate change adaptation

A number of roles were identified by the different organization in ensuring integration of climate change in agriculture (Figure 7). Most common roles cited included: demonstration and dissemination of climate smart agricultural (CSA) technologies (26%); providing climate and climate change information (16%); supporting watershed management/ development for soil & water conservation (15%); encouraging agroforestry (e.g. by providing tree seedlings and related training to farmers) (13%); and sensitizing and creating awareness on climate change (5%). It is clear that some work is being done in relation to climate change in agriculture and that different country have placed focus on different aspects. For example, watershed management for climate change adaptation and mitigation is a major aspect in Ethiopia, while climate-smart practices are a major consideration in Kenya. This may be due to the focus of the major development projects in the respective countries with for example, the project site in Kenya being a part of two large projects promoting climate-smart practices (KCSAP and ASDSP). Watershed management on the other hand has been a key focus of development projects in Ethiopia, although climate-smart agriculture has also been a major focus of Ethiopia's Climate Resilient Green Economy Strategy (CRGE) and sustainable land management programmes (SLMP). Agroforestry, awareness raising on climate change and CSA capacity building all were highlighted as focus areas in Uganda. Some organizations like AFAAS, Country Forums, universities are also involved in capacity building of extension officers on climate change issues and yet this is necessary if they are to be able to provide this support to the farmers they work with.

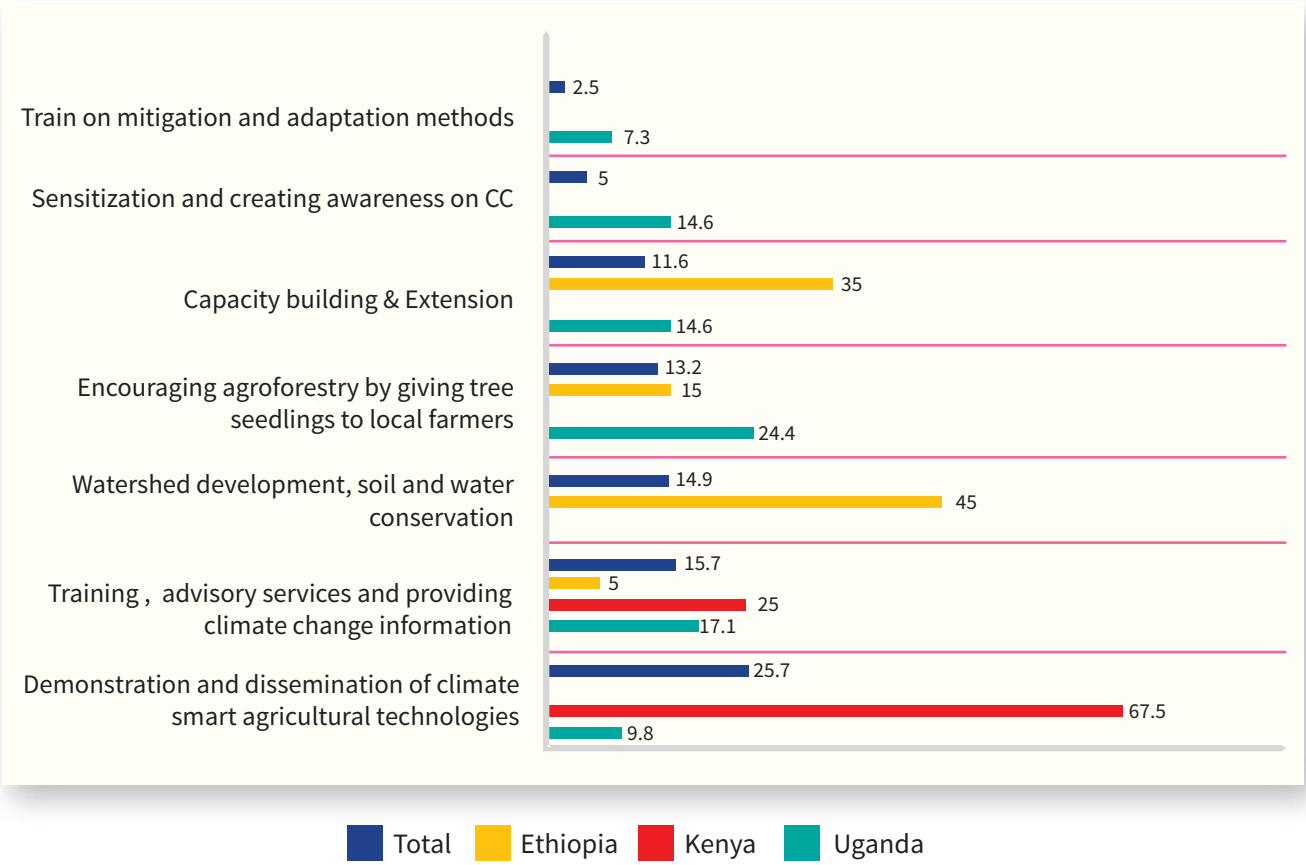



*Figure 8: Roles of organizations in climate change adaptation*

### 3.4.7 Climate changes hazards responded to by organizations

The major climate changes hazards responded to by organizations interviewed across the three countries were drought and floods as cited by 92% and 22% of the respondents respectively. Other hazards responded to include hailstorms, strong winds, heavy rainfall and high temperatures. These manifestations of climate change have greatly affected the production potential of farmers resulting into household food insecurity. This is largely in line with the main hazards affecting the project locations in the three countries.

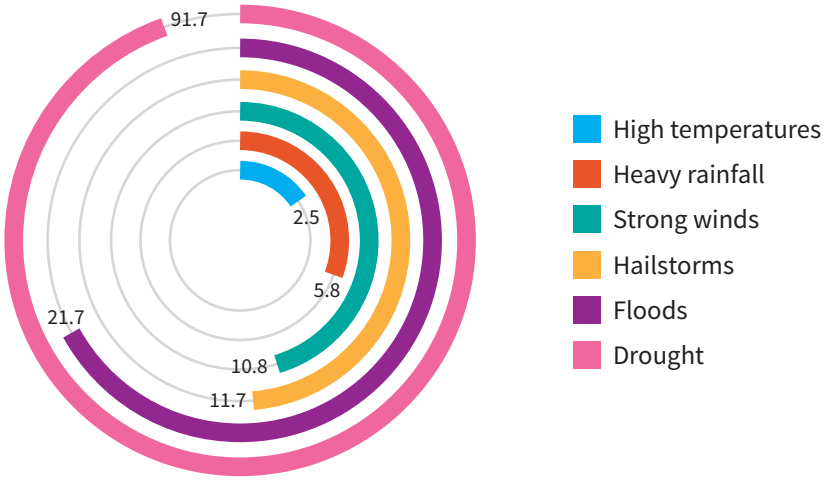



*Figure 9: Common climate change hazards being responded to by organizations*

Furthermore, organizations were probed on how they supported responses to the identified climate risks. In Ethiopia, organizations were mainly focusing on risk management, afforestation and/ or agroforestry, rain-water harvesting and reducing environmental degradation. Organizations in Uganda and Kenya on the other hand, were majorly focusing on pests and disease management, soil conservation, response to crop failures and animal diseases/deaths management. A major issue, is that despite or as a result of the variability of climate, regular occurrence of climate hazards and the threat of climate change, pests and diseases consistently emerge as one of the major systemic risks that reduce the productivity and sustainability of most crops, and affect the product quality. Unfortunately, the abundance of crop pests and the severity of diseases are greatly underestimated; and the losses caused extremely hard to validate. Moreover, high food price fluctuations on account of weather conditions and other factors are also prominent. Capacity building on climate change in agricultural extension must be conducted in a wholesome manner tackling impacts on-the farm, but across the entire agricultural value chain, and addressing and showing linkages between climate change and some of the less apparent impacts (changes in prevalence of crop and livestock pests and diseases for example) Therefore the several organizations recognize this challenge and try to respond to them.

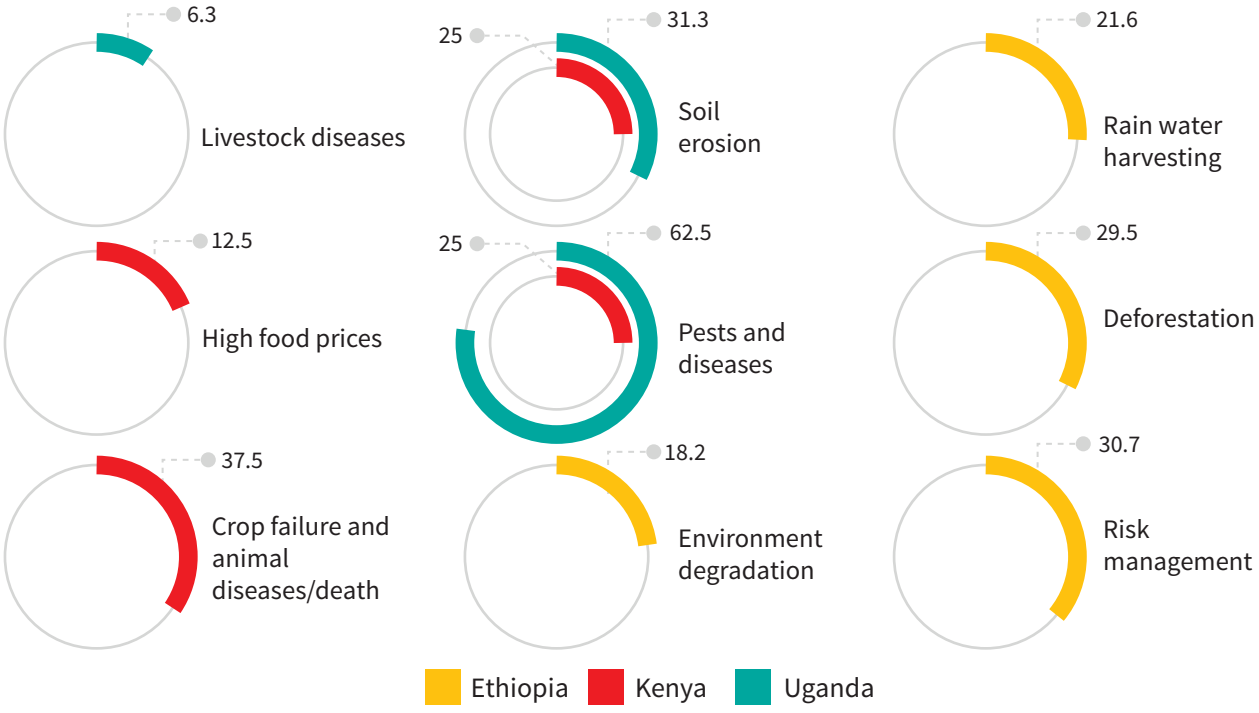



*Figure 9: Risks associated with climate change*

### 3.4.8 Utilization climate related information in extension

The results indicate that a greater proportion of the respondents (95%) utilized climate change information in their extension duties (Figure 10). The majority of organizations in Ethiopia (100%), Kenya (97%) and Uganda (88%) acknowledged utilizing climate related information in their extension works (figure 10).

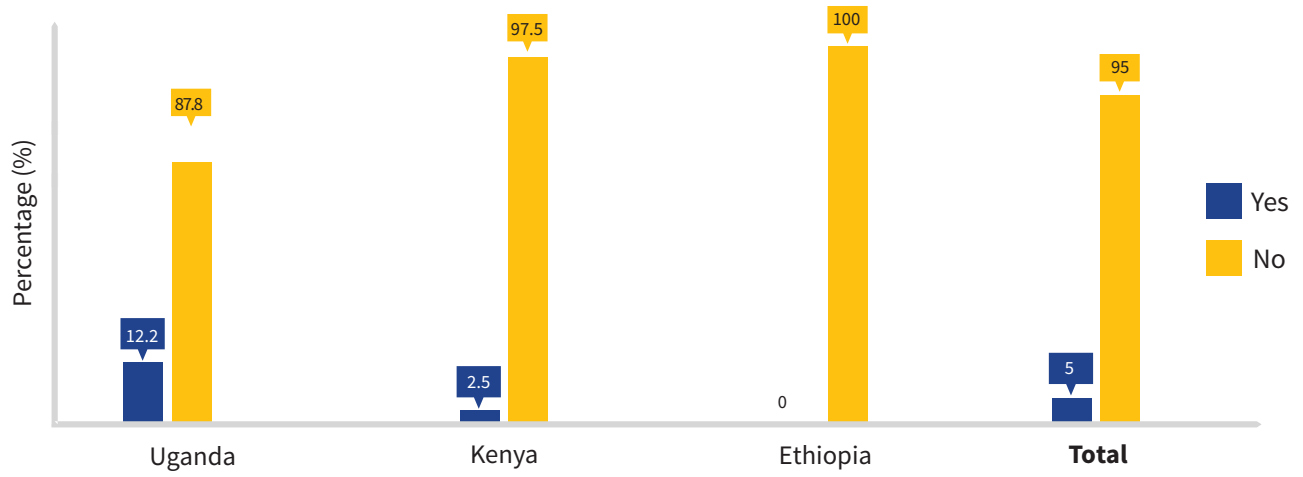



*Figure 10: Utilization of climate change information in extension*

### 3.4.9 Sources of information on climate change

In terms of the sources of the information (Figure 11), the media (34%) was cited as a major source of information on climate change related information in Uganda and Ethiopia (85%) .In Kenya on the other hand, fellow extension workers were cited as the major information source on climate change as reported by 46% of the respondents. Some 33% of the respondents in Ethiopia also reported media while about 18% and 15% of the respondents in Uganda and Ethiopia respectively reported capacity training as their information source. Furthermore, about 14% and 5% of the respondents in Uganda and Kenya respectively also identified online as their information source on climate change issues. Overall although there are some tailored training programmes and courses related to climate issues delivered by governments and development partners, information and knowledge on climate change was often through informal sources and highlighted the need for a more formal and structured capacity building on issues related to climate change and climate information. There remains a gap both within the extension systems and between the extension system and farmers when it comes to climate change information and knowledge.

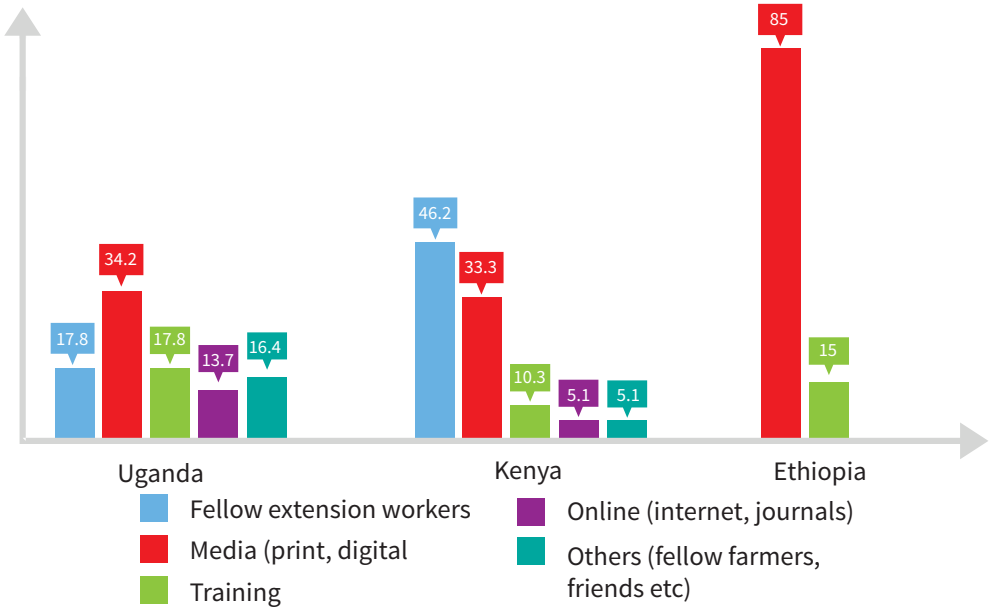



*Figure 11: Sources of information on climate change*

### 3.4.10 Determinants of climate related information collated and delivered to the farmers

A number of important factors informed organizations decisions in collating and delivering climate related information to farmers across the three east Africa countries. In Uganda, factors such as; the demand of information from farmers (26%); availability of information and statistics from UNMA (20%) and the prevailing climate conditions, seasons and locations of some areas (15%) determined the nature of information collated and delivered to farmers among others. Organizations in Kenya were majorly driven by; impending climate hazards and risks (45%); changes in weather; and agricultural enterprises and farm characteristics among others. In Ethiopia, factors such as; weather alerts and rainfall information (32%); post-harvest loses (24%); and crop and livestock (20%) value chain mainly guided the climate change related information collated and delivered to the farmers

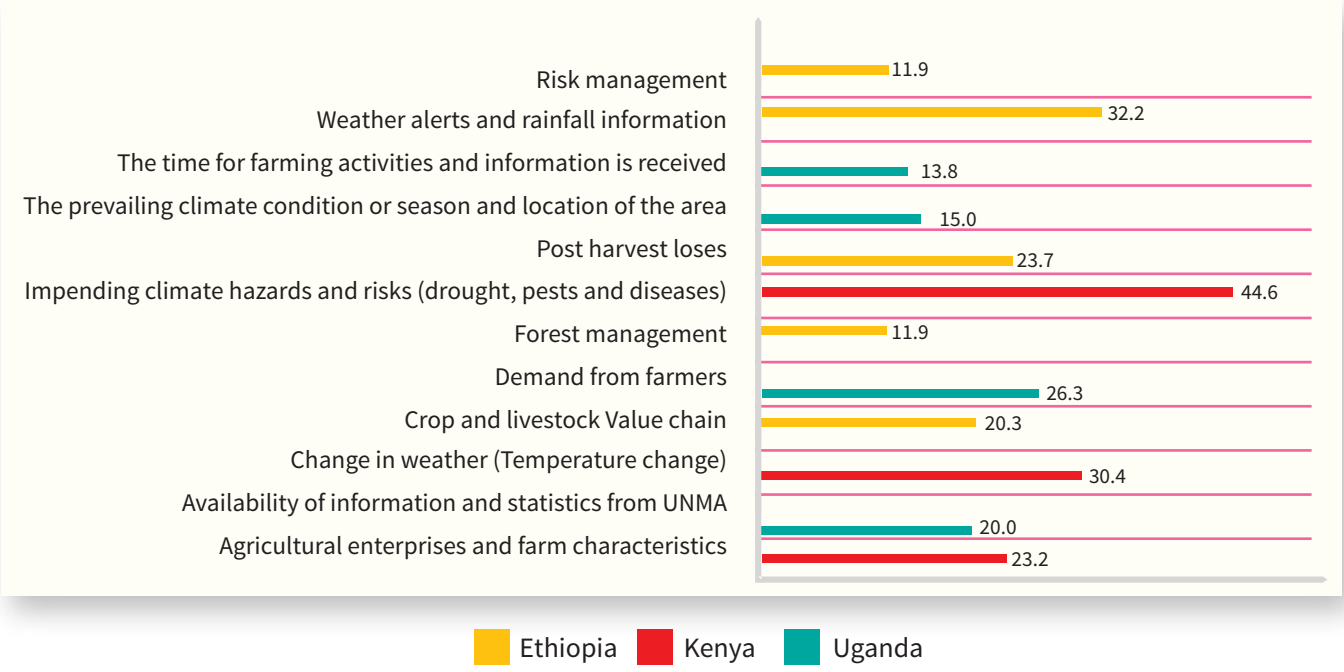



*Figure 12: Determinants of climate related information collated and delivered to farmers*

### 3.4.11 Challenges in the use of information by organizations.

Organizations reached in the three countries encounter a number of challenges in utilization of climate related information. The most common challenges faced by organizations in Uganda were; inaccurate/incorrect weather information leading to speculation (27%); limited knowledge and skills of analyzing, interpreting and packaging of climate and climate change related information by actors (13%) and untimely flow and delivery of information (10%) (Figure 13). Organizations in Kenya were mainly challenged by; reliability and inaccuracy on the information (30%), language barrier affecting interpretation and understanding of the information (20%) and inadequate resources (financial and human resource) to disseminate the information. In Ethiopia on the other hand, organizations were mainly challenged by; poor transport networks (29%); inadequate resources (25%) and the poor networks and communication media to relay CC information to the farmers (22%).

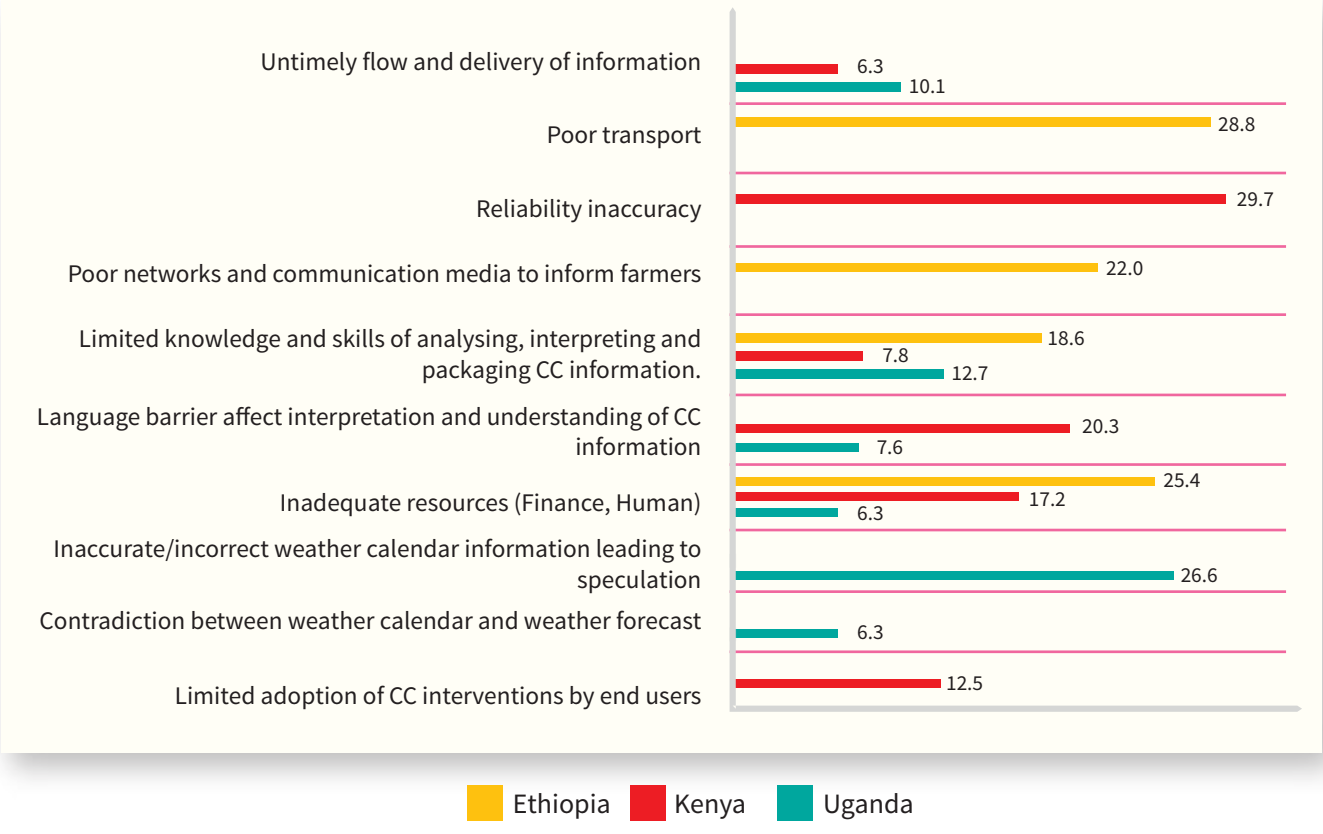



*Figure 13: Challenges encountered by organizations in the use of information*

## 3.5 INDIVIDUAL CAPACITIES

Extension serves a wide variety of stakeholders with different needs. These stakeholders often have differing and sometimes conflicting priorities that make extension and outreach programming a challenge. Extension in the three countries has not yet developed a coordinated effort to identify priority investments at the intersection of climate and agriculture at both regional and national levels. There is a need to examine and analyze existing individual capacities in relation to climate change mainstreaming for agricultural programming. This section assesses the individual capacities of different extension actors who took part in this assessment

### 3.5.1 Involvement in climate change and list of activities carried out by extension agents

In terms of engagement in carrying out extension activities, the results indicate that all the respondents in Ethiopia and close to all respondents (98%) in Uganda and Kenya respectively reported their involvement in climate change activities. Only one respondent in the two countries reported otherwise (see annex 2 for results).

The lists of activities carried out as reported by respondents across the three countries are presented (Figure 14). The most common activities reported in Uganda and Kenya was training and advisory related issues as reported by 27% and 41% of the respondent respectively. In Ethiopia, the most common activity reported was conservation agriculture/activities, soil and water conservation/extension (76%). Other activities reported in Kenya included; attending seminars and trainings on CC interventions (20%); dissemination of climate information and weather forecasts (11%) among others (figure 14).

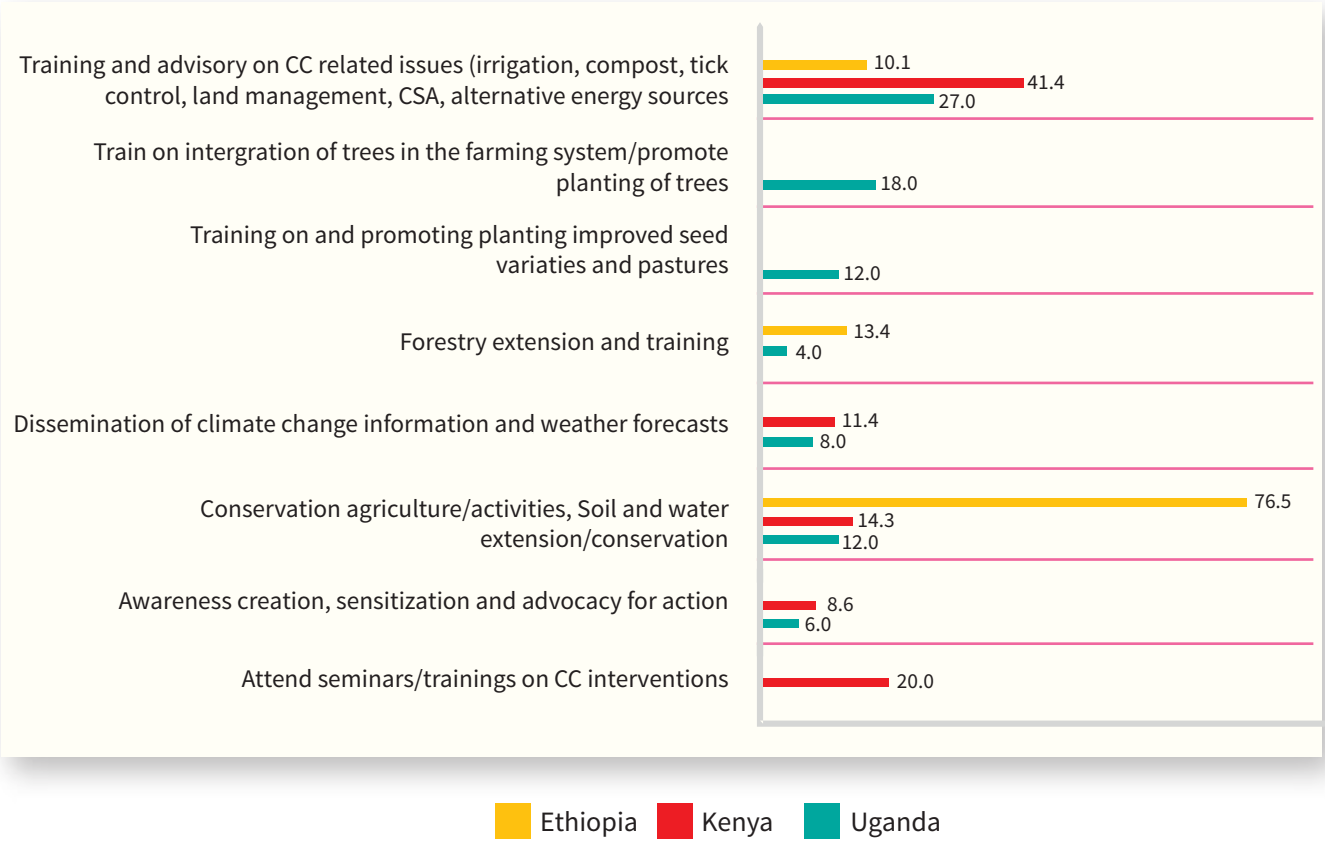



*Figure 14: List of climate change related activities performed*

### 3.5.2 Level of knowledge on climate change

Despite the high levels of perceived involvement in activities related to climate change. the self-assessed level of knowledge on issues of climate change varied in the three countries. From the results, only 39% of the respondents in Uganda deemed themselves knowledgeable about climate change. Half of the respondents in Ethiopia stated not being knowledgeable of climate change while only 36% of the respondents in Kenya indicated that they were only somewhat knowledgeable on climate change issues. Overall, about 29% of the respondent in the three East African countries were only knowledgeable about CC while some 24% were not sure about CC (Figure 15). Therefore, while almost every individual interviewed indicated that they were involved in one way or another in climate change issues, the perceived level of knowledge on the subject indicates a huge gap in the capacity versus the needs in relation to integration of climate change in agriculture.

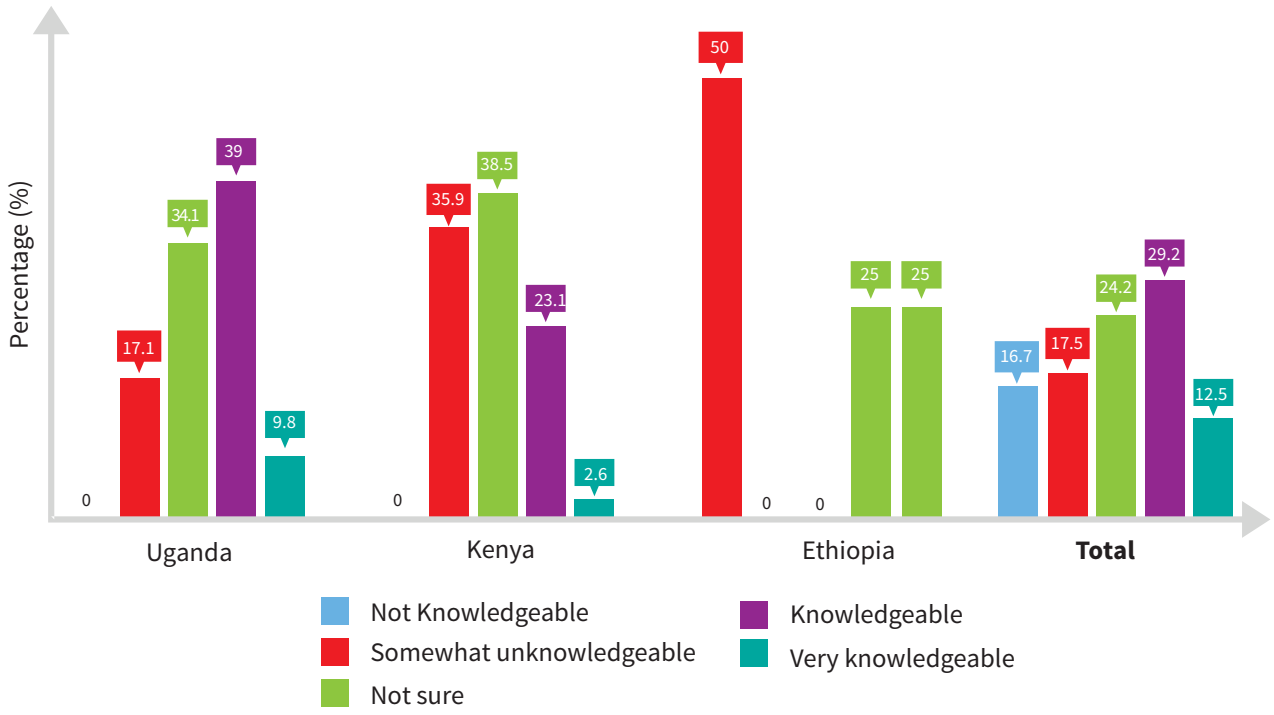



*Figure 15: Respondent's Level of knowledge on climate change*

### 3.5.3 Rating level of knowledge and skills of different climate change issues

Further probing was done into the specific areas of climate change that the extension actors had capacity on (Table 6). Understanding of climate hazards (mean score 3.28) was the top capacity indicated by the respondents, linking closely with the major hazards encountered in the target locations, these being droughts and floods. Understanding of climate change mitigation in agriculture was indicated as “good” skill, however evidence to back this up was not so clear and this result would need further analysis. Knowledge on climate change adaptation and climate-smart agriculture were Monitoring and evaluation of Climate Change in Agriculture programmes and projects (mean score 2.21), facilitating CC integration in agricultural extension (mean score 2.21) and Climate data analysis and interpretation (mean score 2.22) are the most limiting skills amongst respondents. Skills that were rated generally low in all the three countries included: climate data analysis; packaging; presentation and communication of climate and climate change information; and use of ICT. These represent major gaps given that the extension agents are on the frontlines of sharing this type of information with the farmers they work with. In addition among respondents, it was noted that greater awareness raising and training on the farmer field school approach was needed, particularly given the opportunity the approach provides for experiential learning on matter such as climate change adaptation. Closely related to knowledge management is M&E another area where there is a general weakness and yet critical. It is very difficult to work in isolation in matters of climate change and agriculture, yet the extension actors indicated generally poor partnership and networking skills. This area will also require attention.

It is worthwhile to note that the areas of high knowledge and skills in the three countries included: understanding climate change hazards; climate change mitigation; climate smart agriculture; climate change adaptation in agriculture; and community mobilization & community based processes for climate change adaptation and disaster risk reduction. This five areas can further be advanced in improving farmers responses to climate risks and challenges.

*Table 6: Rating of level of knowledge and skills on different climate change issues*

| Knowledge and skills | Poor | Fair | Good | Very Good | Excellent |
|---|---|---|---|---|---|
| Understanding of climate change and variability | 11 (9.2) | 35 (29.2) | 53 (44.2) | 21 (17.5) | 0 (0.0) |
| Understanding of climate hazards | 5 (4.2) | 14 (11.7) | 49 (40.8) | 47 (39.2) | 5 (4.2) |
| Climate change mitigation in agriculture | 17 (14.4) | 20 (16.9) | 63 (53.4) | 12 (29.3) | 1 (2.4) |
| Climate change adaptation in agriculture | 18 (15.3) | 21 (17.8) | 47 (48.3) | 18 (15.3) | 4 (3.4) |
| Climate Smart Agriculture | 26 (22.0) | 23 (19.5) | 53 (44.9) | 13 (11.0) | 3 (2.5) |
| Community mobilization and community based processes for climate change adaptation and disaster risk reduction | 32 (27.1) | 30 (25.0) | 35 (29.7) | 17 (14.4) | 4 (3.4) |
| Climate data analysis and interpretation | 17 (14.2) | 66 (55.0) | 31 (25.8) | 6 (5.0) | 0 (0.0) |
| Appropriate packaging of climate information in agricultural extension | 23 (19.3) | 50 (42.0) | 26 (21.8) | 18 (15.1) | 2 (1.7) |
| Presentation and communication of climate and climate change related information | 33 (28.0) | 39 (33.1) | 26 (22.0) | 17 (14.4) | 3 (2.5) |
| Facilitating CC integration in agricultural extension | 38 (31.9) | 36 (30.3) | 29 (24.4) | 14 (11.8) | 2 (1.7) |
| Monitoring and evaluation of Climate Change in Agriculture programmes and projects | 36 (30.3) | 36 (30.3) | 35 (29.4) | 10 (8.4) | 2 (1.7) |
| Partnerships and networking | 24 (20.3) | 30 (25.0) | 48 (40.7) | 12 (10.2) | 4 (3.4) |
| Farmer Field School Approach | 28 (23.3) | 29 (24.2) | 41 (34.2) | 15 (12.5) | 7 (5.8) |
| Use of ICT | 33 (28.2) | 25 (21.4) | 41 (35.0) | 16 (13.7) | 2 (1.7) |
| Other extension approaches (PRA, HH model approach, demonstrations etc.) | 4 (6.7) | 9 (15.0) | 31 (51.7) | 15 (25.0) | 1 (1.7) |

*(values in parentheses are percentages)*

### 3.5.4 Improvement of lowly rated skills

Figure 16 summarizes the required actions for improving skills of extension staffs. In terms of means of improving skills with low ratings, the majority of respondents in Uganda cite short courses and trainings (particularly courses in which certificates were provided upon completion or on attaining a pass grade), while 28% and 21% of the respondents cite workshops with specific topics and the use of manual and guide books respectively as being of most use. In Kenya and Ethiopia, no clear pathway emerged on the means of improving lowly rated skills.

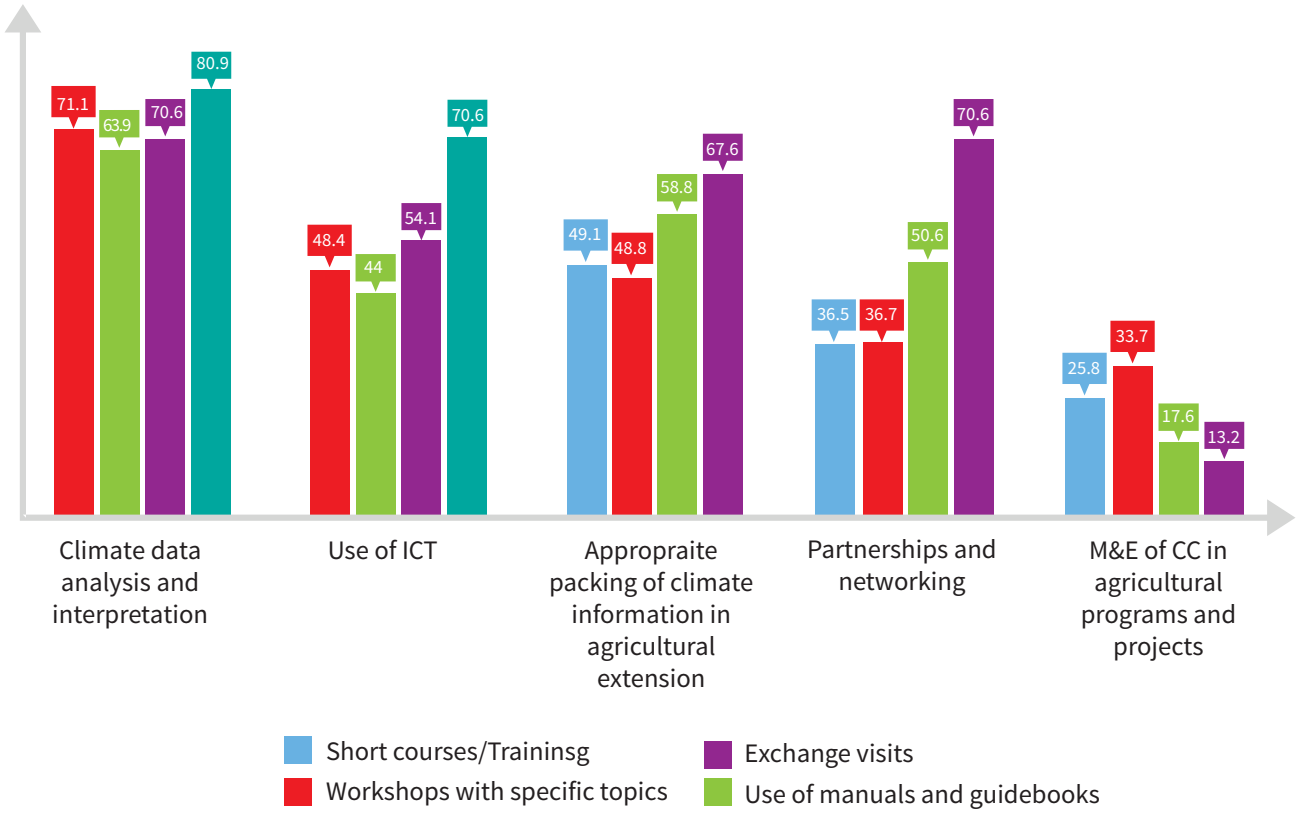



*Figure 16: Suggestions to improve low rating skills*

### 3.5.5 Challenges hindering mainstreaming of climate change

There are a number of challenges and barriers that can hinder extension actor's integration of climate change into agricultural programming (Table 7). Common challenges identified across the three East African countries included: inadequate knowledge and skills on CC (21.1%); limited funding and facilitation for climate change interventions (and extension in general) (15.7%); lack of communication tools (14.3%); lack of logistics availability within extension (and hence for addressing climate change issues) (14.3%); and limited access to training materials and opportunities (13.5%) among others.

| Challenges hindering mainstreaming of climate change | Frequency | Percent |
|---|---|---|
| Inadequate knowledge and skills on CC | 47 | 21.1 |
| Inadequate finances/limited funding and facilitation for CC interventions | 35 | 15.7 |
| Communication tools | 32 | 14.3 |
| Lack of Logistics | 32 | 14.3 |
| Limited access to training and training manuals on CC | 30 | 13.5 |
| Illiteracy, farmers ignorance and cultural norms of farmers | 17 | 7.6 |
| Unreliability, delayed and inaccurate CC information | 16 | 7.2 |
| Lack of technical persons in charge of CC to spear head mainstreaming and management of information | 14 | 6.3 |

*Table 7: Major Challenges hindering mainstreaming of climate change*

Further interaction with different actors highlight deeper challenges, for example: the local norms associated with agricultural practices are generally focused on short-term rather than long-term outcomes. Therefore, the concern about long-term weather patterns (climate) may not seem relevant to a stakeholder concerned about the current season; stakeholders themselves are faced with competing messages about climate change and its impacts from media, local and national organizations and agencies, family, friends, and acquaintances. Furthermore, climate specialists utilize a variety of scientific sources which can lead to differing interpretations of scientific facts. This creates difference in beliefs and comfort levels about climate science, which sends mixed messages to extension actors and their audiences. Moreover, the specialists, extension staff and actors sometimes lack understanding of local audiences and use language and messages that do not well convey the known science about climate and weather conditions. This aspect is quite crucial as often great effort is needed to localize information through translation into vernacular and use of local examples.

Weather hazards (such as flooding, drought, and extreme heat) are well known and easily identified; however effective solutions at the local level are less known and often complex. Furthermore, the extension agents, actors and the farmers themselves lack understanding of how to interpret and give meaning to climate science, climate information, and climate change scenarios, with issues of probability and uncertainty posing a particular challenge. There are also inadequate easy to understand and easy to use climate science and climate change adaptation and mitigation resources available for extension. Documents like the FAO climate-smart agriculture source book need to be localized through development of locally appropriate manuals and guidelines. The extension agents need more research findings tailored to farm decision making to be able to give appropriate advice and recommendations.

### 3.5.6 Recommendations to tackle stated challenges of CC mainstreaming

Overcoming the barriers listed above will require purposeful and specific strategies. Table 8 below provides the recommendations identified by the respondents for mainstreaming challenges of climate change. Major recommendations across the three countries include; proper planning and budgeting towards climate change interventions in agricultural extension; training and capacity building of technical people in climate change and natural resources management; more awareness creation/sensitization of communities on climate change issues; adequate financing support/funding for climate change interventions; and provision of ICT tools for climate change interventions among others.

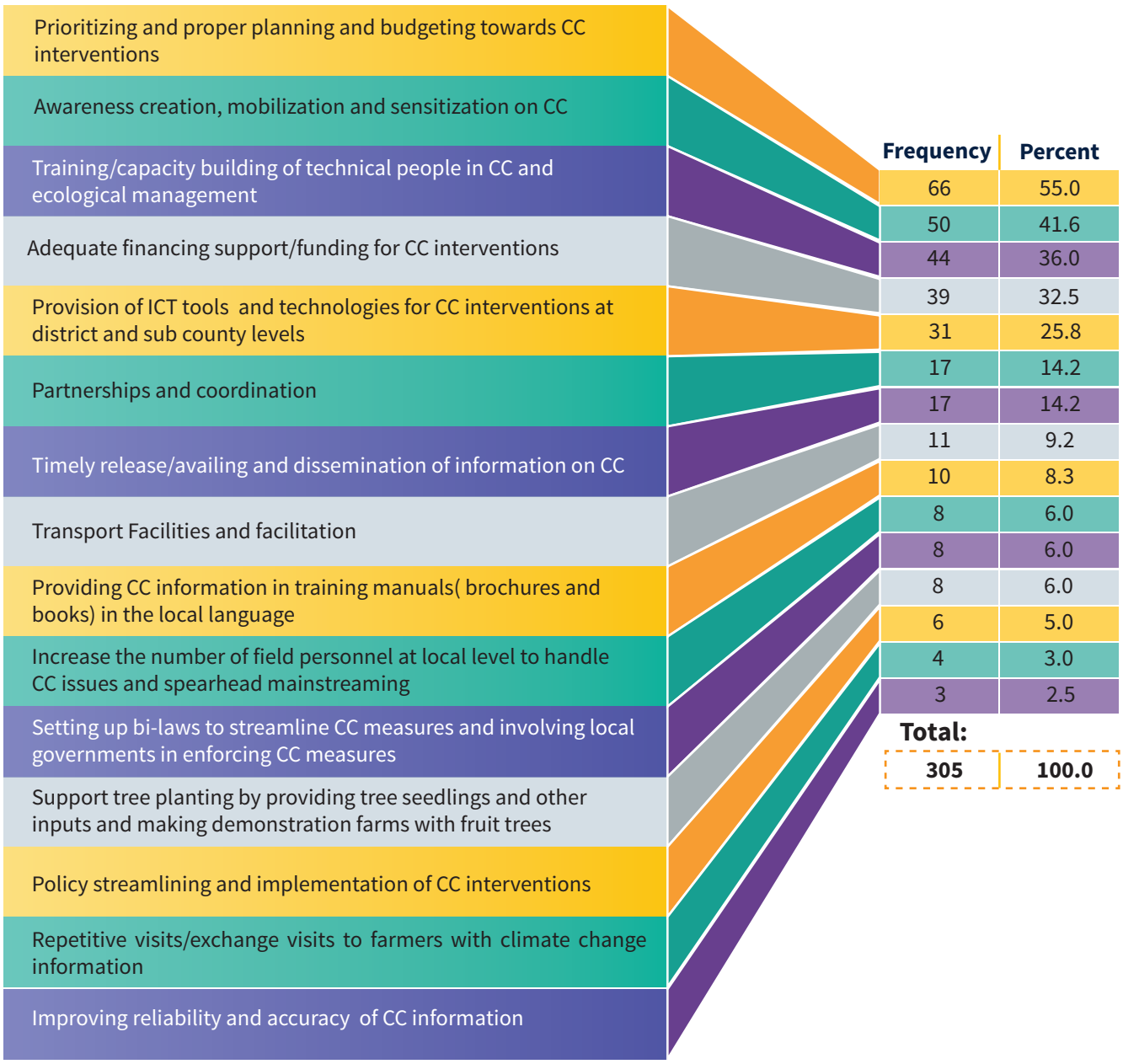



*Table 8: Recommendations to tackle challenges*

Building on the above suggestions, other recommendations to tackle challenges of climate change mainstreaming in extension brought forward by other key actors during interviews include: Leverage existing Extension services, natural Resource Conservation programs, Soil and Water Conservation programs, and other conservation organizations to expand outreach and dissemination of climate change information to target communities; Increasing funding for field-level research and demonstrations that address locally appropriate climate-resilient cropping systems and improve the transfer of knowledge to extension and other actors for use in providing appropriate recommendations; and demonstrate adaptive management strategies such as cover crops, controlled drainage, and erosion control practices among others, using field days and videos will also be vital. In addition, establishing adaption demonstration sites at in the communities will simplify the dissemination of communication of climate related information to the farmers. Furthermore, developing a regional, national and local capacity and communication strategy that prioritizes dissemination of climate change information will be vital. It will also be important to sustain current relationships and be purposeful in expanding relationships with farmers and extension actors to increase trust in extension. Another important strategy is to use examples of recent extreme weather events and impacts at field, and farm level to get farmers attention of climate change. Moreover, offering farmers hands on resources and tools will be critical.

# 4.0

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 4.1 SUMMARY

The environment under which climate change can be integrated into agriculture is still wanting. Specific policies aimed at addressing climate change in agricultural extension are lacking. The existing policies are general to the extent that their implementation can be streamlined in extension. However, there are some policies on climate change and others on agricultural extension which operate independent of one another. There is thus less coordination amongst different policies which necessitates more financial resources and a greater need for coordination between responsible authorities. This makes climate relevant agricultural policies to be shelved with less awareness by potential users.

Many organizations engage in climate change related activities at local level. However, most of them focus on agricultural production, productivity and food security, with little emphasis on other aspects of the agricultural value chain and often only a secondary or particle focus on systematically integrating weather, climate and climate change issues into their work. n terms of personnel, most of the organizations employ agricultural extension professionals as their technical staff. This can be a foundation upon which climate change can be integrated into agricultural advisory services. However, organizations which work closely with farmers and who are often best positioned to deliver climate relevant information to farmers are usually hampered by the challenge of unreliable and inaccurate data, as well as lack of understanding of issues around uncertainty and probability.

Climate data analysis and interpretation use of ICT and appropriate packaging of climate information in agricultural extension are some of the key skills in need by individual extension actors. These three areas, which can be generally referred to as knowledge management, are critical in provision of climate relevant agricultural advisory services. Closely related to knowledge management is M&E of climate change adaptation and mitigation programmes and projects, another area where there is a general weakness and yet critical. It is very difficult to work in isolation in matters of climate change and yet the extension actors have poor partnership and networking skills whose capacity will require enhancement. Different mechanisms of improving such skills could be through exchange visits, use of manuals and short courses. For M&E skills, however, workshops on specific topics will be required.

Furthermore, commitment to climate change adaptation and mitigation in agriculture must be strongly signaled at all levels of the extension organization. Different climate change actors both at regional and national level are consistently providing messages that nations must act to adapt to climate change; as such, extension programs, as the interface with farmers, should be equipped to support the implementation of such. Moreover, purposefully and systematically working to ensure that extension and other actors are exposed to locally-relevant information on climate change, climate change adaptation and climate-smart agriculture is necessary. In addition, generating climate related information (scientific, traditional, technological etc.) that answers critical questions for agriculture, and put it in usable formats and language that enhance the ability of extension agents and actors to convey such information is critical.

## 4.2 CONCLUSION

This assessment conducted across three countries in eastern Africa provides a strong foundation and a unique opportunity for different actors and stakeholders in agriculture and climate change in the region to build and strengthen institutional and individual capacities to provide extension programming for integrating climate information in Agriculture. Although there are some projects and programmes that support the integration of climate considerations in agriculture and capacity building of extension actors on locally appropriate climate change adaptation and mitigation actions, there is limited evidence on specific national or sub-national policies for integrating climate change in agricultural extension. Where they exist, there are disjointed efforts in implementation due to limited awareness and financial support. Organizations which would have advocated for them work more-less in isolation with less coordination and networking amongst themselves. There are limited climate change knowledge management systems and the extension agents have inadequate capacity to internalize the information and the communication tools.

## 4.3 RECOMMENDATIONS

### Enabling environment

1. Climate change adaptation and mitigation should be mainstreamed into relevant new and existing extension and agriculture policies at all levels of administration and within all relevant sectors so as to reduce vulnerabilities to the impacts of climate change.

2. Climate change issues should be kept high in policy and decision making for agricultural and extension. Locally appropriate adaptation measures need to be prioritized according to their urgency or importance based on set and agreed criteria. This can be done by highlighting potential solutions and proving feedback on policies and progress

3. Carry out advocacy campaigns targeting policy makers and planners to increase their awareness of the importance of formulating and implementing climate change responsive agricultural extension policies and programs

4. Advocating for greater allocation of resources for agricultural extension both in their entirety as well as in the context of supporting climate change adaptation, climate change mitigation and resilience building activities will be crucial given that across all three countries government extension is often understaffed and under resourced despite the crucial role they play in supporting the countries' national and international development and climate change related goals.

5. Taking a value chain approach to the integration of climate change adaptation into agricultural extension is recommended. Given that climate impacts and vulnerability to food security and climate change appear in and affect various stages of the agriculture value chain from input supply to marketing and sales, while some climate impacts have less clear impacts (changes in prevalence of crop and livestock pests and diseases as a result of changing weather patterns for example).

## Organizational capacities

6. Climate change should be mainstreamed in agricultural extension planning and budgeting from national to local level. The approach taken should be similar to that in which gender issues have been prioritized in all planning activities. In this way, the issue of limited funding will be minimized.

7. Climate change knowledge management systems should be enhanced through the improvement and development of local level mechanisms for collaboration and linkages between government departments working on issues of climate research, climate information, agricultural development, natural resources management and agricultural extension. The potential organization should have a development knowledge management system with a large coverage of advisory actors. The partnership should be able to provide training and communication tools.

8. Continued capacity building and support to organizations charged with generating climate information, conducting climate change research and providing data in terms of personnel and tools. This will help in improving accuracy and reliability of the climate relevant information

9. Facilitate establishment and maintenance of innovation platforms where different stakeholders involved in generating, packaging, disseminating and utilizing and climate change related information can converge and share their experiences and needs.

10. Supporting the improvement of an development of local level mechanisms for collaboration and linkages between government departments working on issues of climate research, climate information, agricultural development, natural resources management and agricultural extension

11. Although the focus of this study was not on climate information, strengthening channels for communication and dissemination of climate information through government structures and extension systems will go a long way in increasing farmer knowledge of and response to climate hazards and climate change.

12. A detailed historical climate analysis to demonstrate the changes in climate spatially over the target districts will be a key in laying the foundation for further capacity building on climate change adaptation and integration of climate change into agricultural extension within the project. The analysis should highlight the major hazards and the major changes in the climate across the target locations.

### Individual capacities

13. It is also important to broaden the conversations related to climate change, adaptation and mitigation to include business and agricultural advisers (e.g., agricultural retailers, banking institutions and/or financial advisers). Understand the roles that different types of advisers play in agricultural decision making and engage each appropriately. This will broaden communication pathways for climate change adaption and mitigation technologies and responses.

14. Extension agents, as the link between farmers, the national meteorological services and agricultural researchers, should be supported to better understand, interpret, package and share information on weather, climate and climate change to help farmers make better management decisions. At present this is a huge capacity gap that needs to be addressed. Decision support tools can help farmers improve their management, adaption and mitigation to climate change.

15. Trainings for extension agents on new innovative methodologies for understanding and communicating information on weather, climate and climate change could be supported. Methodologies such as PICSA could be an important entry point, while developing technical briefs and sensitizing extension agents on historical climate trends and possible climate change scenarios could also play a key role

16. Identifying and promoting capacity building on prioritized climate-smart practices by development partners and local governments in the target locations is advised for a more targeted and cost effective approach rather than trying to address climate change and climate change adaptation as a broad topic. For example in Kenya, there is a focus on specifically identified technologies, innovations and management practices (TIMPs) which can also be supported under ACREI

17. Translation of available materials into local languages through participatory processes between meteorologists, extension actors and farmers themselves will be important in creating awareness and knowledge of climate change and climate change adaptation among targeted farmers.

## 4.4 CAPACITY DEVELOPMENT ACTION PLANS

Capacity development plans are country specific and have been prepared in terms of recommendations for the gaps identified during capacity assessments. These actions plans can be found in the respective country reports.

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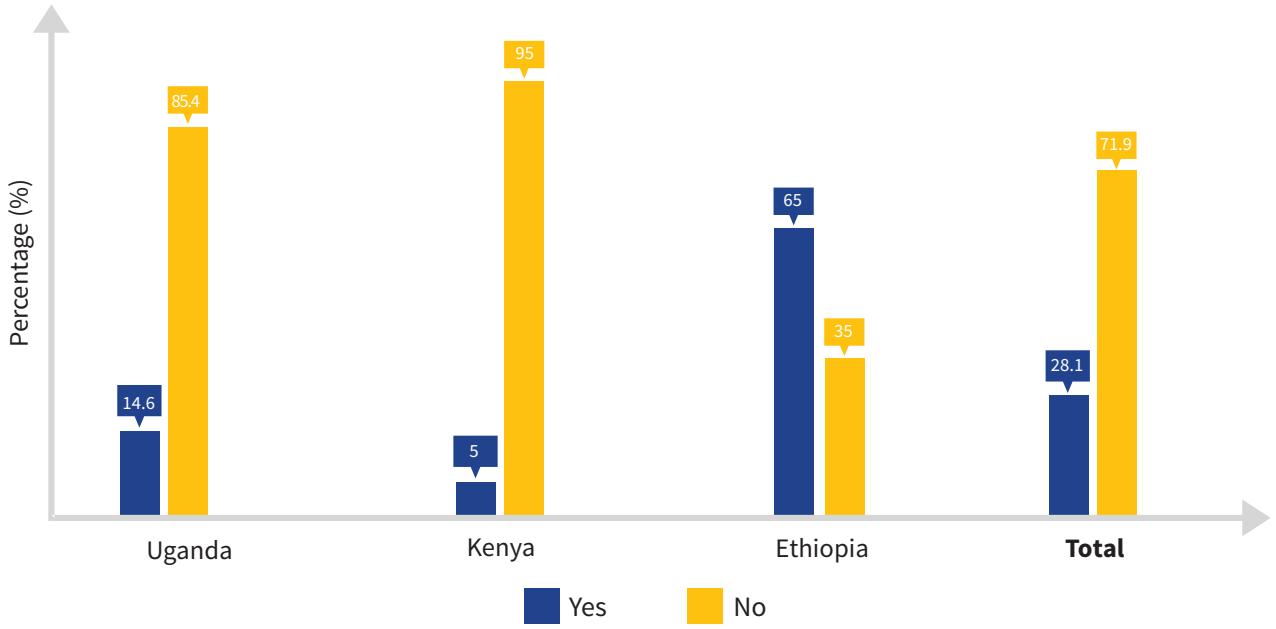
## Annex 1: organizations reached for KIs

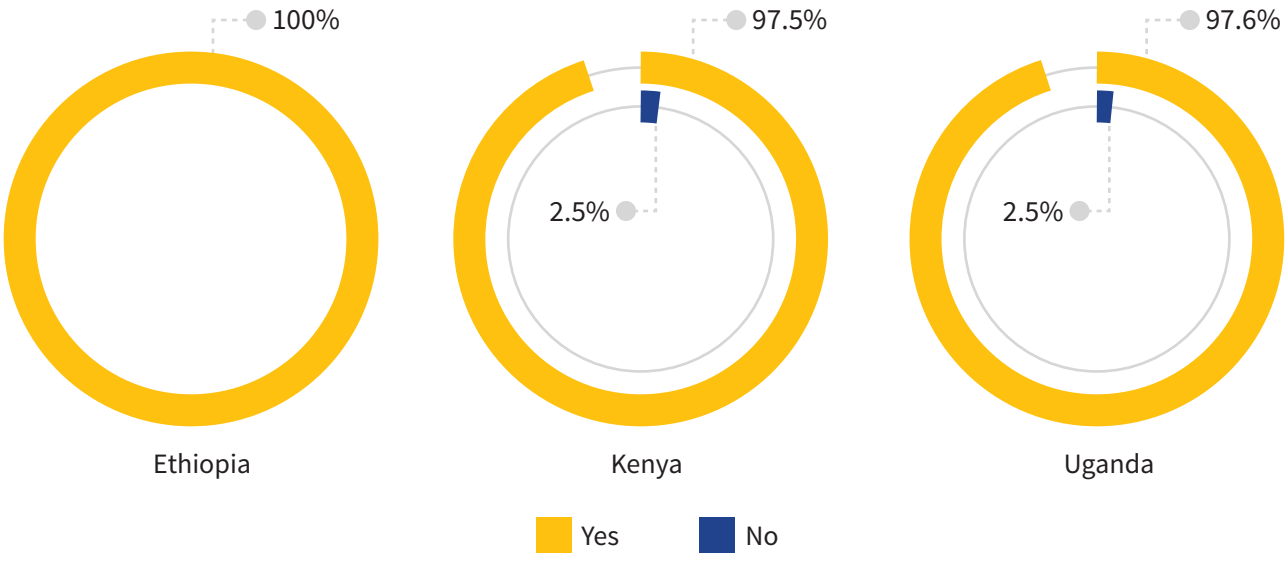
| | |
|---|---|
| **Uganda** | • National Agricultural Research Organization (NARO)<br>• Makerere University Centre for Climate Change Research and Innovations (MUCCRI)<br>• Uganda National Meteorological Authority (UNMA)<br>• Climate Change Department (CCD)<br>• Ministry of Water and Environment (MWE) Enabling Environment for Agriculture activity (EEA)<br>• Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) |
| **Kenya** | • Famine Early Warning System Network (FEWSNET)<br>• CARE-AFRICA<br>• Centre for Agriculture and Biosciences International (CABI)<br>• Sub county agricultural officers<br>• Agriculture chief executive committee members<br>• Kenya Meteorological Department (KMD)<br>• Kenya Agriculture and Livestock Research Organization (KALRO)<br>• CLIMATE CHANGE INNOVATION CENTER |
| **Ethiopia** | • Haramaya University<br>• Ministry of Agriculture (MoA)<br>• National Meteorological Agency (NMA)<br>• Food and Agriculture Organization of the United Nations (FAO)<br>• Oda Bultum University<br>• Zonal Bureau of Agricultural<br>• Woreda agricultural offices<br>• Oromia Regional Bureau of Agriculture<br>• Research centre<br>• CARE Ethiopia-NGOC<br>• Catholic Relief Services (CRS)-NGO<br>• Kebelle Farmers' organizations<br>• Oda Blttom Farmers Cooperatives Union |

*TABLE 9: Organizations reached for KI*

## Annex 2:




*Annex 2 : Presence of other organizations working on climate change extension*




*Involvement of extension agents in climate change activities*

# REGIONAL REPORT

**African Forum for Agricultural Advisory Services (AFAAS)**

House No. 26, Kigobe Robe, Minister's Village Ntinda, Kampala

AFAAS

ADAPTATION FUND

WORLD METEOROLOGICAL ORGANIZATION

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