

STUDY REPORT

Enhancing indigenous practices in climate change adaptation among small scale farmers

Soroti and Mubende district

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UGANDA



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List of Abbreviations

DAOs	District Agriculture Officers
CS	Civil Society
CSO	Civil Society Organisation
DFID	Department for International Development
EAC	East African Community
ESAFF	Eastern and Southern Africa Small Scale Farmers' Forum
IFAD	International Fund for Agriculture Development
FGD	Focus Group Discussion
GoU	Government of Uganda
KII	Key Informant Interviews
LG	Local Government
NAADs	National Agriculture Advisory services (NAADs)
NAPA	National Adaptation Plan of Action
NAP	National Agriculture Policy
NDP	National Development Plan
NPA	National Planning Authority
NEMA	National Environmental Management Authority
NGO	Non-governmental Organization
NNGO	National Non-governmental Organization
NRM	National Resistance Movement
PELUM	Participatory Ecological Land Use Management
TACC	Territorial Approach to Climate Change
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
SSFs	Small Scale Farmers

Acknowledgement

The report is a result of the opinions and contributions from many experts and stakeholders on agriculture and climate change. ESAFF Uganda wishes to appreciate the Norwegian Embassy in Uganda for the financial support which made this study possible.

While the contributors to this study cannot all be acknowledged by name, we wish to extend our sincere appreciations to ESAFF district networks for Soroti and Mubende districts for mobilising small scale farmers to participate in the study. We also appreciate the small scale farmers who took time from their busy schedules to participate in the study. Your contributions were very paramount in informing the development of this report.

The research team would like to express their gratitude to all the people that have been helpful in making this research possible and worthwhile. Special thanks to the district and Sub-county officials in the study districts especially Mr. Amuriat Micheal, the Acting District Agriculture Officer for Soroti district, the Sub-county LC3 Chairperson and Production Officer for Kamuda Sub-county in Soroti district, Mr. Sebuggwawo George, Agriculture Officer, Bagezza Sub-county in Mubende district and other officials that participated in this study.

Lastly, we wish to register our appreciation to our consultants who conducted the study and ESAFF Uganda staff and national board members for providing comments during various phases of the study.

Executive Summary

ESAFF Uganda commissioned a study on Indigenous Practices to Climate Change adaptation by Small Scale Farmers in Mubende and Soroti districts. The overall objective of the study was to assess and find out the different indigenous practices small scale farmers use to adapt to the changing climate in their localities. In addition, the study also addressed issues related to indigenous knowledge on climate change and the role of development partners in relation to climate change.

The study adopted a qualitative approach of data collection. Two main data collection methods were used namely, review of documents and consultations through interviews with key informants and focus group discussions.

The study found out that small scale farmers in Soroti and Mubende districts have adapted to climate change by use of various indigenous practices which included and not limited to, mulching, mixed farming, intercropping, crop diversification, digging trenches, conserving crops, cultivation of wet lands for growing greens fetching water for animals, early planting, growing well adopted varieties ,crop rotation, afforestation, use of stocked dried grass to feed animals, compost manure/using cow dung, planting drought tolerant crops, planting early maturing varieties of crops and other small scale farmers claimed reducing their food consumption as well as changing their diets to cope with climate variability.

The study recommended that the government needs to consult rural communities when planning adaptation techniques for small scale farmers; need to implement the Uganda National Climate Change Policy since it has very good interventions and priority areas; creation of awareness of climate change and its impacts among the population especially in rural areas where it was found that most SSFs didn't understand climate change; need to use community radios while communicating weather and rainfall information to small scale farmers since they are easily accessible and in reach to small scale farmers' among others.

The study also found out that small scale farmers face a great deal of challenges in their struggle to adapt to climate change in the districts of Soroti and Mubende like disappearance of indigenous knowledge, some practices are expensive in terms of costs involved while others are associated with termites, pests and diseases caused by the indigenous practices, limited access to water sources, Poor post-harvest handling of produces among others.

In conclusion, there is a fundamental linkage between agriculture and climate change. This study provides evidence of a much needed role of government and development partners in addressing climate change adaptation using indigenous knowledge.

1.1. Brief on the Study

1.1.1 Background of the Study

Although climate change affects Uganda as a whole, the magnitude of its impacts varies across the population within the certain sections of society being at the worst end of the continuum. It is now known that the global climate is changing, principally as a result of burning fossil fuels and agriculture related land use change which contributes to the greenhouse effect. Climate change is defined differently but still with the same meaning in different societies. Climate change is now a well-accepted reality and there is emerging evidence that climate change poses a threat to development. The world over climate change has become a big threat especially to small scale farmers. Agricultural activity is highly sensitive to climate change largely because it depends on biodiversity and environmental conditions. Climate change contributes to vulnerability through creating greater uncertainty and unpredictability in the environment within which poor small scale farmer live and build their livelihoods. The precise implications of climate change may include predictions of rainfall rates, amounts and patterns, the likely frequency of extreme weather events, and regional changes in weather patterns cannot be made with certainty.

Climate Change adaption in this current situation is a desired solution of reducing the impact of climate change on agriculture. Indigenous knowledge has been identified as one of the most powerful tool of adapting to climate change using different indigenous practices. Small scale farmers have always had their indigenous practices that they use to adapt to climate change. It is from this background that ESAFF-Uganda commissioned a study on the Indigenous practices that small scale farmers' use in climate change adaptation in Uganda

1.1.2 Objective of the study

The objective of this study was to understand the different indigenous practices being used by small scale farmers to adapt to climate change in Uganda and draw recommendations for up scaling indigenous knowledge in climate change adaptation as well as create a pool of knowledge that small scale farmers can use to advocate for policy change towards support of indigenous practices for Climate change adaptation in Uganda.

1.1.3 Scope of work

The study targeted small scale farmers in rural areas and local government officials. The study engaged with small scale farmers in Soroti and Mubende districts. The study conducted literature review and interviews with small scale farmers as advised by ESAFF Uganda.

1.2. Context Analysis

1.2.1. Understanding Climate Change

Climate change is one of the greatest challenges affecting the world today, as the world's climate continues to change at rates unprecedented in recent human history. A variety of stresses such as deforestation, land degradation and heavy dependence on biomass for energy have exerted pressure on Habitats and ecosystems in Africa and hence causing changes in the climatic conditions. Climate change in Africa is a major factor for agriculture advancement and has had great negative impact on the small scale farmers in the sub-Saharan region. Though different areas have different adaptive capacities, several communities have adjusted automatically to the changes in climate and came up with indigenous ways of adapting to climate change while others still lag behind. It is no doubt that farmers in the different parts of Africa have come up with their own unique ways of surviving the adverse climate conditions which they do not quite understand but are happening.

Climate change can be defined as a change in climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (GoU, 2007). Uganda's climate is naturally prone to flood and drought events which have had negative socio-economic impacts on the people. Climate change has also been termed as the variation in the statistical distribution of weather patterns occurring over time scales of decades or longer. Uganda is severely vulnerable to climate change and its vulnerability is set to increase between 2010 and 2030 (Climate Vulnerability, Monitor, 2012).

In Uganda, these changes are already influencing many systems which are vital for human livelihood, including water, food security and health. Uganda is one of the countries that are greatly vulnerable to climate change impacts, in respect of climate variability including; increasing temperatures, intensity of rainfall, heat and water waves, floods and droughts. In general, the sectors most vulnerable to climate change impacts include agriculture, water supply and health.

1.2.2. Causes of Climate Change

Climate change is caused when fossil fuels are burnt and release carbon dioxide into the atmosphere. This results into a high concentration of green house gases in the atmosphere which further creates a solar radiation imbalance making the Earth warmer. This trapped carbon pollution heats up, altering the Earth's climate patterns.

The largest source of this pollution is the burning of charcoal for energy. Climate change is caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions.

Some human activities have also been identified as significant causes of recent climate change, often referred to as global warming. Some of these activities include; cutting down of trees for firewood, charcoal burning, settlement, farming, burning among others.

While carbon has entered the atmosphere for millions of years through natural events such as forest fires and volcanoes, the burning of fossil fuels has resulted into the increase of greenhouse gases in the atmosphere.

1.2.3. Effects of Climate Change

Climate change has serious implications on the economic status of vulnerable populations like small scale farmers and these implications include;

Diseases and illnesses arising out of climate change undermine savings and improvement in the standard of living because these people will have to spend from their meager incomes on accessing medical care. The Western Uganda highland areas were previously malaria free zones (Namanya, 2009).

Climate change has led to household food insecurity, malnutrition, poor health and eventually death. Moreover, declining crop yields due to prolonged drought, unreliable rainfall patterns, floods and pests have challenged people's ability to produce or purchase sufficient food. The prolonged droughts have also reduced the grazing potential in the cattle corridor. Climate change has also led to spread of diseases like malaria and foot and mouth, soil erosion and land degradation; flood damage to infrastructure and settlements and decrease in productivity of agricultural among others. Rising sea levels due to the melting of the polar ice caps contribute to greater storm damage; warming ocean temperatures are associated with stronger and more frequent storms; additional rainfall, particularly during severe weather events leads to heavy flooding and submersion of agricultural fields, transport infrastructures and homesteads etc; an increase in the incidence and severity of wildfires threatens habitats, homes, and lives; and heat waves contribute to human deaths and other consequences.

1.2.4. National response to climate change

The Government of Uganda, civil society organizations and development partners are undertaking various interventions to mitigate the impact of climate change and variability in the country.

Government of Uganda response to climate change

Government has started various projects and programmes including design of policies, programmes and interventions to combat climate change in Uganda. The National Development Plan 1&2 and Vision 2040 have each an element of climate change. Though Uganda has a policy on climate change under Minsitry of Water and Environment, its implementation remains in limbo. The policy proposes the creation of new institutional structure such as; a ministerial committee on climate change, a national climate change advisory committee and a new climate change department within the Ministry of Water and Environment which would be useful in combating climate change in Uganda, however, some of these are not operational.

Over the years, the government through the National Planning Authority (NPA) has developed national guidelines to integrate climate change in all sectoral plans and budgets. Other climate change related policies in place include; Renewable Energy Policy 2007 and Disaster Management and Preparedness Policy among others. As a commitment to mitigate climate change, Uganda is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) 1993 and the Kyoto protocol, 2006. Uganda is also a signatory to regional policy framework like the East African Community (EAC) protocol on Environment and Natural resource Management, EAC climate change 2011 and other regional platforms. Despite all the above, Vision 2040 highlights that there is still poor understanding of climate change hence inadequate adaptation and mitigation measures. There is slow implementation of the policy, limited awareness on climate change among the population in rural areas, (NPA, 2011) and insufficient networking among key stakeholders, however, government

proposed to design appropriate adaptation and mitigation measures to combat climate change.

Civil Society Organisations

Ugandan civil society organisations with support from development partners have the potential to play an incredible role in supporting an effective response to adapt and mitigate the effects of climate change in Uganda. Many of the civil society organisations have led tree planting campaigns, have educated the masses on use of alternative energy sources like biomass among others. However, there is need for civil society to invest heavily in advocacy and research in order to identify the priority issues for an effective response to the effects of climate change in Uganda.

Development Partners

Uganda has a number of development partners who are working on supporting government of Uganda and the civil society to mitigate and adaptation the effects of climate change in Uganda. Some are supporting the establishment of a National Climate Change Unit; to mainstream climate change into planning and develop a national strategy for adaptation while some have provided the much needed financial resources to fund climate change activities. The role of Development Partners in all these initiatives under both Government and CSOs cannot be overestimated. However, there is little financial commitment by development partners in Uganda to support climate change adaptation at the moment.

2.1. Overview of the study area

Two districts were sampled in two different regions and these included; central and Eastern regions. One Sub-county was further sampled in each district for this study and these included; Nabingola and Kamuda in Mubende and Soroti districts respectively. The choice of the study area was guided by the fact that Mubende is one of the major producers of cereals like maize and millet, ground nuts and cassava, while small scale farmers in Soroti grow a diversity of crops especially legumes and cereals typical crops include millet, sorghum, rice maize, cassava and cotton now grown by a few farmers and live-stock are reared in both districts.

Both districts are characterized by range of land shrubs with very intense human activities which outs both districts vulnerability which affect agriculture. Many of the respondents noted that Mubende is one of the districts that lie in the cattle corridor characterised by scarcity of water, dry spell and outbreak of diseases, water scarcity and animal diseases.

Although, agriculture is the major economic activity in both districts with pastoralism more dominant in Soroti compared to Mubende, there other economic activities which include; trade, fishing and transportation of people and goodies. According to PELUM, 2010, Majority of the population depends on subsistence farming as the main source of livelihood with animal husbandry and crop farming as the main agriculture activities. Mubende district is diverse with a number of tribes while Soroti is dominated by people who speak Ateso.

2.2. Study Area

The study was conducted in the districts of Soroti and Mubende. The selection targeted two districts from two different regions of the country with different variation in climate and weather patterns, different culture and tradition norms and resource constraints.

2.3. Sample selection

The selection was done in two different levels. The first level was the selection of districts in which the study was conducted. Stratified random sampling method was used in selecting districts. Here two sub counties were sampled, one from each district. After selecting the districts and the sub counties, selection of small scale farmers was done at the sub-county level. The selection of small scale farmers was

done by ESAFF district chairpersons in the sample districts, sampled small scale farmers who were randomly selected and were representative of each of the districts. It should be noted that the selection of final respondents depended on the method of data collection to be used and the nature of information needed. This has been further discussed in the data collection methods below;

2.4. Data collection methods

This study entailed reviewing small scale farmers' response measures applied amidst changing seasons. There was a deliberate assessment of indigenous practices (IP) of farming communities concerning climate change impacts. This entailed analysis of community perceptions, attitudes on the adaptation practices. Farmers in the study communities were organized in groups which were gender sensitive and then interviewed. The study methodology used qualitative approaches and was participatory where appropriate.

2.4.1. Review of literature

A number of documents were reviewed including documents describing study design and documents related to climate change. More of the reviewed documents can be found in the annex 1 of the report.

2.4.2. Key Informant Interviews (KII)

These were mainly targeting key informants such as local political leaders, District Agriculture Officers (DAOs), sub-county Agriculture officers, among other technical persons who are directly involved in programs related to climate change. Their views, observations, and experiences with regard to the study problem were sought. However, it is important to note that the key informant guide were designed and guided by the study objective.

2.4.3. Focus Group Discussions (FGDs)

These focused group discussions were held at venues convenient to small scale farmers in the two selected districts. FGDs were held to obtain information on the Indigenous practices used to adapt to climate change in their respective areas. The FGDs were chosen because they were participatory and interactive hence a discussion approach was adopted. The consultants got a good representation of members from different small scale farmer's groups in the respective districts. One FGD was held in each of the selected sub-counties with a representation of 8 to 14 members. Cross cutting issues like gender were considered during the discussions.

2.5. Data cleaning, Analysis and Report Writing

As this study was purely qualitative in nature, data collected was edited from time to time for accuracy, completeness, uniformity and consistence among others. Data was analysed, during and after data collection. Primary information collected from various sources was consolidated, analysed and the report prepared to give a full and detailed assessment of the indigenous practices used by small scale farmers to adapt climate change in Soroti and Mubende districts.

2.6. Ethical considerations

Ethical consideration was a big issue during the study. Several initiatives were taken to protect the identity of participants that took part in the study. During the FGDs and the KIIs, all participants were assured of confidentiality during and after the interviews and they were assured that their identities would be protected in the report. Participants were also allowed to decline to answer a question if they were not comfortable with it.

2.7. Limitations of the study

The study was majorly characterised by a number of limitations which included:

Poor timing of the study: Politics in both districts affected the study for example NRM elections in Mubende district where held on the same day of our consultation with the small scale farmers likewise in Soroti, Amama Mbabazi's consultation meeting took place on the same date hence affecting the turn up of respondents, all this had a greater bearing on the study.

Language barrier was a major limitation during the consultation meetings in both sub counties for example Mubende district is a multi-cultural district with over 10 different cultural beliefs, norms and languages meanwhile. Soroti is an Ateso speaking district. However this limitation was addressed by having translators with a good understanding of the local language of our interest.

There was gender imbalance in both districts for example; there were more males than females during the FGDs. It was anticipated that the cause was due to bad timing since many of the females were engaged in preparing meals and taking care of the families.

CHAPTER THREE: STUDY FINDINGS

Since climate change is an unfolding challenge with no known end point yet, adaptation needs to be understood and operated as a process, through which communities gain access to skills, resources and information so that they can continuously shape their lives and livelihoods as the climate changes around them.

3.1. Understanding of climate change and climate change adaptation

Participants in the FGD were asked about their understanding of climate change and climate change adaptation. Few participants in both districts noted that climate change is the variation in the climate while climate change adaptation is the way people cope up with the changing climate. Other participants said that climate change is made by God and they think it can only be solved by God. Some participants could acknowledge the change in the climate but couldn't really explain it or its causes. Surprisingly, all participants understood the effects of climate change on their livelihood and had developed different adaptation techniques as discussed further in the next sections.

3.2. Access to information on climate change by small scale farmers

Both participants in the focus group discussions and key informant interviews in both districts were asked to mention the channels through which they access information on climate change. They unanimously agreed on a broad range of communications channels that help to aid access to information on climate change such as agriculture talk shows on radios, group leaders, when they attend climate change related workshops, meetings and trainings, agriculture extension officers and through short messages (SMS) on their phones. However, farmers in both districts noted that there is need to use community radios when communicating any information on climate change since those radios are in their reach.

3.3. Use of Indigenous knowledge on Climate Change Adaptation by Small scale farmers

According to participants, Indigenous knowledge is used for local level decisionmaking on climate change adaptation by small scale farmers in the districts of Soroti and Mubende. Its value is not only for the culture in which it evolves, but also for scientists and planners striving to improve conditions of small scale farmers. However, it is imperative to note that incorporating indigenous knowledge into climate change adaptation programmes can lead to the development of effective adaptation strategies that are user friendly and sustainable hence making it cost effective and inclusive of small scale farmers.

The study also found out that women are particularly known to possess indigenous knowledge which helps to maintain household food security, particularly in times of drought and famine. In both districts, women are the ones who commonly use these indigenous practices because they are the ones who till the land, grow crops for subsistence among others. Documentation of indigenous knowledge is very important because of its usefulness in combating climate change in many communities of Uganda.

3.4. Seasonal changes as a result of Climate Change

The registered seasonal changes in Soroti and Mubende districts are attributed to climate change. Small scale farmers revealed that previously Soroti district was experiencing rains in the periods of January to February and dry spell during June to July. A number of activities would happen during the rest of the months for example; gardening, planting, harvesting, drying of millet and cassava and weeding; gardening and weeding for the second season, feasting among others.

In Mubende district, small scale farmers reported that they used to experience a dry spell during the period of February, March and June while August was for a rainy season with October and December experiencing heavy rains in the district. The rest of the months were full of activities which included; planting, weeding, harvesting, and drying of bananas, fishing and others.

However, all these seasons have changed due to climatic changes in the respective districts. The rain doesn't come in a time when it's expected and this is attributed to a number of factors including; high population which exerts a lot of pressure on the environment, deforestation and burning of charcoal among others.

Table1: Indigenous se	asonal calendar	in Soroti	District

Month	Month in Ateso	Activities	Crops grown	
			In English	In Ateso
January- February	Orara- Omuk	Waiting for rain	-	-
		Fishing in river banks and swamps		
		Hunting for wild animals		
March-May	Okwang-Odungei	Gardening	Millet	Alosi
		Planting	Ground nuts	Emado
		Weeding	Maize	Mudungu
		Harvesting white aunts	Cassava	Emwango
			Potatoes	Kata
			Cow peas	Ngor
			Sim Sim	Nino
			Sorghum	Bel
			Green grains	Elekidi
June –July	Omuruk-	Harvesting	-	-
	Omodokolingoi	Garden clearing for the second season		
		Harvesting mushroons (ebaale imaruk).		
		Spraying		
		This period is full of a dry spell		
August	Oloja	Harvesting	Millet	Kalo
		Planting for the second season	Ground nuts	Emado
		Drying of millet and it is this time that the time	Maize	Mudungu

Month	Month in Ateso	Activities	Crops grown	
			In English	In Ateso
		millet brew of the season is tested.	Cassava	Emwango
			Potatoes	Kata
			Cow peas	Ngor
			Sim Sim	Nino
			Sorghum	Bel
			Green grains	Elekide
September	Ocoto	Weeding the second season rain crops.	-	-
		Grass cutting for house thatching		
October-	Osokosokoma-	Harvesting	-	-
November	Osuban	Sun drying of silenced food crops		
		In October the grass begins to dry and		
		November is when rituals are performed like		
		last funeral rites.		
December	Оро	Garden preparations and sun drying of cassava	-	-
		and potatoes		

However, the seasons of nowadays are unpredictable

Source: Field Study FGD in Soroti District, Kamuda Sub-County

Table 2: Indigenous seasonal calendar in Mubende district

Month	Month in Luganda	Activities in the month
lanuany	Gatonya	Hanyest of Matooke (Banana)
Echruany March	Mukutula Scania	Fotching of water due to coarcity
repluary – March	Musula Naisa	Felching of water due to scarcity
	Mugula Nsigo	February: Banana leaves dry oπ
		Buying seeds for planting
April	Kafumula Mpau	Pastoralists move back to their homes
		Crop farming, Water harvest
		Planting season begins
May	Muzigo	Time for appearance of health green
		vegetation's which appears oily hence
		the month Muzigo.
June	Ssebo Asseka	Maize starts to dry up before it matures
		due to drought.
July	Kasambula	Clearing and preparation of gardens
		including bush burning
August	Muwakanya	There is sun and rain
September	Mutunda	This is the time when edible ants called
		"Entunda" appear in Mubende
October	Mukulukusa Bitungo	There are heavy rains that erodes Sim
	tungo	Sim trash as it starts to grow
November	Musenene	This is the time of Grasshoppers.
December	Ntenvu	In December, Ntevu start flying all over
		Mubende due to sunshine that appears
		due to rains

Source: Field study FGD, Mubende district

3.5. Indigenous Practices used in Climate Change Adaptation by Small scale farmers

Small scale farmers of Mubende and Soroti districts have used their local knowledge to adapt to climate change in their respective districts. A number of studies have cited that the ability of human systems to adapt to and cope with climate change depends on factors such as wealth, technology, education, information, skills, infrastructure, access to resources and management capabilities. The study found out the different indigenous practices employed by small scale farmers in the areas of Soroti and Mubende districts to adapt to climate change and these included though not limited to, mulching, mixed farming, intercropping crop diversification, digging trenches , conserving crops, cultivation of wet lands for growing greens, fetching water for animals, early planting, growing well adopted varieties, crop rotation, afforestation, use of dried stocked grass to feed animals, fertilisation/using cow dung, planting drought-tolerant crops, changing the timing of planting, planting early maturing varieties of crops and other small scale farmers claimed reducing their food consumption as well as changing their diets to cope with climate variability. Some of these indigenous practices that small scale farmers use to adapt to climate change are further described below:

Mulching: This is a process of covering the soil surface around the plants with grass both dry and fresh to create congenial conditions for the crop growth, its one of the most beneficial practices that small scale farmers are using for better crop or plant health. Mulching is generally used to improve the soil moisture balance and can reduce the amount of time spent on tasks such as watering and weeding. Small scale farmers in Soroti and Mubende districts stated that they use fresh banana leaves as mulch to cover their gardens, this helps soil retain moisture in dry season, prevent weeds from growing and protect the roots of plants in rainy season hence help crops to have a life with high yields in both rainy and prolonged dry season of the year. Natural mulches, moderate soil temperatures, suppress diseases and harmful pests and conserve soil moisture if agronomically applied.

Inter cropping: This is the growing of two or more crops simultaneously on the same piece of land (field). Some small scale farmers have adapted the practice of inter cropping for example in Soroti district, small scale farmers inter crop maize, cassava and ground nuts. This helps crops to be more resistant to disturbance and

resilient to environmental perturbations, breaks down the monoculture structure, provide pest control benefits, weed control advantages, reduced wind erosion, and improved water infiltration. Intercropping gives higher income per unit area than sole cropping to small scale farmers and acts as an insurance against failure of crop in abnormal year, and maintains soil fertility as the nutrient uptake is made from both soil layers. It's upon those added advantages of intercropping that small scale farmers have adapted the practice in-order to cope up with the changing climate in Uganda.

Agro-forestry practices: This is a land use management system in which trees are grown around or among crops/pastures land. Many small scale farmers in Kamuda and Nabingola sub-counties of Soroti and Mubende districts respectively have adapted to Agro-forestry practices, this practice provides shade tree cover to protect crop plants against climatic changes. Farmers influence the microclimate by retaining and planting trees, which reduce temperatures and wind. This practice contributes simultaneously to buffering small scale farmers against climate variability and changing climates, and to reducing any atmospheric loads of greenhouse gases.

Planting early maturing varieties of crops: Small scale farmers have in the past grown early maturing varieties of crops such as ground nut and maize which have been modified to the current seerenett (2,6,7) and maize longe (4 and 7) such improved early growing varieties have helped small scale farmers in Soroti district to adapt to climate change. The reasoning is that by the time dry season clocks in, the crops have grown and less affected by sun hence adapting to changes in climate.

Use of granaries: Many small scale farmers have built granaries which they use to store both food crops and cash crops. The commonest food crops stored in the granaries include, silenced potatoes and cassava, maize, beans, sim sim, sliced bananas and cassava, soya beans among others. These are later used for eating during periods of famine and some are used for planting. Some small scale farmers in Soroti district also store grass in granaries.

Water harvesting: small scale farmers harvest water during rainy season and also fetch some from boreholes and dams which is then stored for future use more so during dry season. This water is used for home consumption, animals and watering the crops. Here water is put in a basin and spread in the garden using leaves, this was found to be common in Soroti district.

Movement of Pastoralists from one area to another: Small scale farmers in Soroti district move their herds in search of fresh pasture and water this is common in the drought season. In action to adapt with climate change, some pastoralists in Soroti district have changed from cattle to sheep and goat husbandry, as their feed requirements are lower. The pastoralists' nomadic mobility reduces the pressure on low-capacity grazing areas through their cyclic movements from the dry to wetter areas. Some pastoralists use the following indigenous practices to adapt to climate change for example in times of drought include; use of emergency fodder, culling of weak livestock for food, and multi-species composition of herds to survive climate change effects. This is commonly used in Soroti district.

Other indigenous practices adopted by small scale farmers include; controlled bush clearing, this is where the bush burning is done through a controlled mechanism. In some areas for example; in Soroti district, small scale famers use tall grasses for fixing soil surface nutrients which have been washed away by runoff and use of soil erosion-control to reduce the effects of runoff, these both help to keep the fertile soil within the same area; restoring lands by using green manure which makes the soil more fertile and suitable for agriculture; constructing stone dykes which act as barriers to managing and protecting river banks to avoid flowing of water.

3.6. Challenges faced by small scale farmers while adapting to climate change

Adaptation often produces benefits as well as forming a basis for coping with climate change. However, experience demonstrates that there are challenges faced by small scale farmers in achieving full potential adaptation to climate change. Some of the challenges revealed by small scale farmers during the study include;

Some of the practices used are very costly to small scale farmers for example; mulching which requires transportation of the materials to be used from one point to another. This becomes costly to farmers since they survive on meager resources. While some farmers fear mulching because it is associated with termites.

Disappearance of indigenous knowledge; some small scale farmers do not know how to use some of the indigenous practices because they have never been oriented on their use and there is no documentation that they can read to understand their practicability. This affects their ability to use such practices. Pests and diseases; many of the small scale farmers are faced with pests and diseases. Some of the diseases faced by small scale farmers in Soroti include; foot and mouth disease (Ayec), East Coast fever (Makebe), Trachoma (Tuondaing) among others. These affect animals and lower their immune system making them vulnerable which affects their adaptation to climate change.

Poor post-harvest handling of produces which makes some crops to become dirty due to poor drying, package and storage facilities. This lowers the quality and value of the produces which are stored in the granaries hence making them prone to effects of climate change.

Small scale farmers also sighted the lack of sub-county or district specific seasonal or rainfall results since the Uganda Meteorology Department has always predicted the likely rainfall and weather patterns for the specific regions in the country and the results are shared in the media but do not generate district specific results.

Limited water facilities for example; most of the water dams that were constructed by government under the NUSAF projects are no longer functional. Some small scale farmers in Soroti district noted that they nolonger water their gardens due to lack of water facilities in their localities. This affects their ability to cope up with the changing climate.

Soroti district experiences floods caused by too much rainfall or flowing of water from the river banks. These floods destroy crops and animals.

CHAPTER FOUR: CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

It's important to integrate the indigenous knowledge and practices in the day to day life of small scale farmers in all communities for easy adaption to climate change. This study discovered that SSFs are using different techniques in adapting to climate change. Small scale farmers face a great deal of challenges in their struggle to adapt to climate change in the districts of Soroti and Mubende and if not addressed, these may affect the continuity of the use of indigenous practices in climate change adapation.

Finally, it's important to note that small scale farmers in Soroti and Mubende districts use indigenous practices to adapt to climate change, however, it should be put into attention that the implementation of these indigenous practices are specific to location because what works best in Mubende district differs from the best practice in Soroti district and should base on land use, planning i.e land capability and suitability for example pastoralism works best in Soroti district than in Mubende district.

4.2. Recommendations

Based on the findings, a number of recommendations need to be undertaken by small scale farmers, CSOs, government and development partners in order to promote the use of indigenous practices.

Investment in climate change adaptation: This study revealed that some small scale farmers can't use some practices because of the economic ties to them. There is need for government to set a vote in the national budget for climate change adaptation for rural communities.

Preserving indigenous knowledge: There is an urgent need to preserve indigenous knowledge on climate adaption; this should be a combined effort by small scale farmers with support from government and CSOs to document share and preserve indigenous knowledge and practices.

Consulting rural communities when planning adaptation techniques: The government needs to consult rural communities when planning adaptation techniques for small scale farmers. This is because the rural communities have the indigenous knowledge that is important for planning and implementation of adaptation mechanism. This will enhance their engagements and participation in climate change adaptation techniques and policy issues and processes at all levels.

Need to implement the Uganda National Climate Change Policy since it has very good interventions and priority areas. Government should operationalise the following structures; a ministerial committee on climate change, a national climate change advisory committee and a new well facilitated climate change department within the Ministry of Water and Environment. There is also need to implement other policies and programmes related to climate change which are already in place

Need to create awareness of climate change and its impacts among the population especially in rural areas where it was found that most SSFs didn't understand climate change. This should come along with the awareness creation on the existence of the policy on climate change and the National Adaptation Action.

In line with the above, there is need for government to revitalise and equip district weather stations relevant to small scale farmers in their localities. This will help in giving appropriate and relevant adaption information to small scale farmers.

Government, CSOs, development partners or any other stakeholders should use community radios while communicating weather and rainfall information to small scale farmers, since they are easily accessible and in reach to small scale farmers'. The information communicated should be in the respective local languages that are convenient to small scale farmers.

The government should improve on rural infrastructures relevant to small scale farmers to facilitate adaptation to climate change; by providing access to water through rehabilitation and construction of valley dams, construction roads that connect to market centres, construction of community granaries for storage of produces among others.

Government should integrate climate change adaptation using indigenous practices in the current livelihood programs for some rural communities like Operation Wealth creation, Youth livelihood program among others since it was revealed that some adaptation practices are costly for small scale farmers. Civil society organisations (national and community organisations) need to mainstream climate change in their work. They should also engage in research for evidence based policy advocacy at all levels.

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Study Tools

The tools used for focus group discussions and key informant interviews can be obtained from ESAFF Uganda using the address below. ESAFF Uganda can also make the list of participants in this study available for you on request.

Brief about ESAFF Uganda

The formation of ESAFF in 2002 was a direct response to the need to create a forum where Small Scale Farmers (SSFs) are able to facilitate processes through which farmers' development concerns can be solicited, articulated and ultimately addressed through local and national policies and programmes. The forum was established to bring together small scale farmers into a social movement to build common aspirations, learning and linkages. ESAFF Uganda works to enhance the SSFs ability to make informed decisions and participate meaningfully in development processes through capacity building, advocacy, research and institutional development. ESAFF Uganda is part of a bigger network of small scale farmers in other countries including Rwanda, Burundi, Kenya, Tanzania, Swaziland, Zambia, Zimbabwe, Malawi, South Africa, Lesotho, DR Congo, Madagascar, Seychelles and Mozambique

ESAFF Uganda is having members in 30 districts including Soroti, Serere, Amuria, Ngora, Bukedea, Kumi, Kabale, Kisoro, Masaka, Mubende, Mityana, Mukono, Nebbi, Zombo, Kamuli, Jinja, Mbale, Mayuge, Bugiri, Gulu, Amuru, Nwoya, Pader, Adjumani, Manafwa, Iganga, Arua, Apac, Kasese and Kanungu

Our Vision

Empowered self reliant small scale farmers

Our Mission Statement

To nurture the participation of small scale farmers in sustainable development processes, for self reliance through advocacy, capacity building and institutional development

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