VISO VOLUNTARY INITIATIVE SUPPORT ORGANISATION

VOLUNTARY SERVICES ABOVE ALL

Project Title: Climate Change Adaptation and Resilience in Northern Uganda (CCARNU)

Heading 1: State of the art, rationale and relevance

Introduction

The world's sustainable development goal number 13 aims at taking appropriate actions to combat climate change and its impacts. Climate change and variability affects every facet of a country's economy; It impacts on the social well-being of the people, their economic status and in some instances is a political precursor/driver for conflicts as people scramble for the limited available resources. A key question that needs answers is how prepared are African states to face the negative impacts imparted by climate change and variability? Climate change manifests in several ways, i.e. droughts, floods, varying temperatures and rainfalls and sea level rise (Hertel and Rosch 2010; Barbier 2015). Climate change presents itself as a complex problem; the definition of the problem being very difficult and its solution is one that has everyone chasing for an answer.

According to Kaggwa et al. (2009), climate change and poverty are closely interrelated in a viscous cycle. It should be noted that hunger and poverty are already biting African economies and climate change and variability will further escalate these challenges. Evidence points to the fact that African states will be most hit by climate change and variability owing to their inability to cope with these hostile changes (IPCC 2007; IPCC 2013; Hepworth & Goulden, 2008).

Closely associated with climate change is the concept of vulnerability, the foundations of which is based on the study of natural hazards (Janssen et al., 2006; Dong et al., 2015). Vulnerability has been defined by Timmerman (1981) as "the degree to which a system may react adversely to the occurrence of a hazardous event." In connection to climate change and impact, vulnerability has been closely linked to concepts such as resilience, marginality, susceptibility, adaptability, fragility and risk (Hewitt, 1984; Kates et al., 1985; Wilhite and Easterling 1987). The most vulnerable population is one which is often highly dependent on the biophysical environment. Northern Uganda is heavily dependent on rain-fed agriculture and because of reliance on the natural environment, this has escalated its degradation. For instance, there has recently been an upsurge in the charcoal and tree logs business which has caught the attention of policy makers and there is now a heated debate on how to regulate and find alternatives to household fuels and construction materials in Northern Uganda.

In assessing the impact of climate change, two approaches can be used (Parry, Carter and Konijns 1998). A direct approach is aimed at tracing the impact of a specific change in a physical input variable (e.g. temperature, rainfall, etc) on yields or biomass and eventually, the effect on the economy and society as a whole. A second approach, the disjoint method, looks at the sensitivity of the exposure unit to a range of climatic variations. For instance, how vulnerable is a household or a farmer to a drought. According to Liverman (1990), if we are to understand and delimit vulnerability, we need to know how and where the physical environment may change. Adequate insights into the population at risk can then be made based on physical indicators.

In regard to the aforementioned challenges, innovative approaches need to be developed to address climate change challenges. One such strategy is to develop and strengthen climate and climate change information management and early warning systems (EWS) targeting specific local communities. According to WMO (2010), warning systems are meant to empower individuals and communities to respond timely and appropriately to the hazards posed by climate change in order to reduce the risk of death, injury, property loss and damage. The affected community will need to take necessary action after receiving the message passed across to them.

Rationale:

Uganda continues to experience unpredictable rainfall patterns and high average temperatures. These climatic variabilities impact negatively on food security, human health, transportation as well as the general livelihoods of people. Oxfam (2008) reports that in the last 20 years, Uganda has experienced seven droughts with regular incidences of extreme temperature, seasonal shifts and reduction of rainfall. According to USAID (2014), eight major droughts that affected nearly five million people have hit Uganda in the past two decades. Within the same period, the country has also experienced 18 major floods and four significant mudslides which have displaced more than one million people destroying infrastructure, disrupting markets and cutting off people from social services. The country is currently ill-prepared to face the challenges posed by climate variability and efforts need to be stepped up to build capacity of locals to adapt to and mitigate these challenges. It should be noted that many of the

USAID (2013) carried out a climate change vulnerability assessment under ARCC project. The study findings indicate that Northern Uganda districts of Gulu and Lira are most vulnerable to the impacts of climate change. Vulnerabilities to the impacts of climate change include changes in rainfall patterns, the potential for prolonged drought, health-related risks, loss of soil fertility due to heavy runoff, frequent floods, and increase in pests and diseases due to higher temperatures (GOU, 2013).

A few attempts have been made regarding climate modelling and prediction of average temperatures and rainfall patterns in areas which experience adverse climate conditions in Uganda. Egeru et al. (2019) analysed historical, near future, mid- and end-century rainfall and temperature over Karamoja sub-region. Similar studies were carried out earlier over the Central Uganda cattle corridor (Nakaseke and Nakasongola districts) by Nimusiima et al. (2014) which have been experiencing very high temperatures resulting in deaths of hundreds of cattle. However, the Acholi, Lango and Westnile sub-regions have not been explored extensively in regard to climate modelling and prediction. These three regions suffered the most during the 20-year war in Northern Uganda with people being displaced from their homesteads and shifted to squatter camps. These three sub-regions are also hosts to several hundreds of refugees from South Sudan, which has been experiencing political instability recently, even though they have since seceded from Sudan and Democratic Republic of Congo.

The changing weather and climatic patterns will continue to pose hazards and disasters to inhabitants within the earth ecosystems. It is imperative that we should shift away from a reactionary approach to dealing with climatic challenges to a proactive and holistic approach in which we are well prepared to combat the challenges posed by adverse weather and climatic changes (UNDP 2016). It is in this regard that this project sets out to develop climate change information management systems and early warning systems for Acholi, Lango and West Nile sub regions of Northern Uganda. It is expected that this project will play a vital role in informing policy and act as an information bank on climate issues to interested parties within the economy e.g. farmers, aviation industry, local population, etc.

Heading 2: Objectives and results expected

Goal of the project: To enhance knowledge and information on climate change and variability for response planning and sustainable development in the greater Northern Uganda.

General objective:

✓ **Specific objectives:**

- Improve People's knowledge on climate change in Northern Uganda and West Nile sub-region.
- Improve community access to information on climate change for behaviour change and environmental protection.
- Assess levels of community vulnerability to climate change in Northern Uganda and West Nile sub-region.
- Model future climate projections over Northern Uganda and West Nile sub-region.
- Determine appropriate climate information services (CIS) that can be provided to households, farmers and the general community in Northern Uganda and West Nile Region e.g. PICSA.

✓ **Expected results:**

S/No	Objective	Results expected
1.	Improve People's knowledge on climate change in Northern Uganda and West Nile sub-region	Information generated on the level of knowledge on climate change by the local population.
2.	Improve community access to information on climate change for behaviour change and environmental protection	community participate in actions to protect and conserve the environment.
3.	Assess levels of community vulnerability to climate change in Northern Uganda and West Nile sub-region	Effect of climate change on people's livelihoods assessed.
4.	Model future climate projections over Northern Uganda and West Nile sub-region	Predictive tool(s) for climate change variability built.
5.	Determine appropriate climate information services (CIS) that can be provided to households, farmers and the general community in Northern Uganda and West Nile Region e.g. PICSA.	Packaged information on climate change generated and distributed to the various sectors/stakeholders in Acholi, Lango and West Nile sub-regions.

Heading 3: Indicative project methodology

✓ Study area:

This study will be conducted in three sub-regions of Northern Uganda, i.e. Acholi, Lango and West Nile sub regions. The Acholi sub-region consists of 7 districts while the Lango sub-region has 8 districts. West Nile is a sub-region in North Western Uganda comprising of 9 districts. The predominant tribes in these sub-regions regions are the Acholi, Langi, Lugbara, Kakwa, Madi and the Alur.

✓ Climate data:

Weather and climate data will be obtained from the Uganda National Meteorological Authority. A computer based Regional climate model will be employed to model and predict

future climate trends over the three sub-regions in Northern Uganda. Temperature and rainfall variability are the main climatic variables which will be investigated.

✓ Field studies: Consultative discussions with key stakeholders

An approach to manage climate risks and improve resilience, referred to as PISCA (Participatory Integrated Climate Services for Agriculture), will be employed to help farmers make the best decisions in carrying out their activities (Dayamba et al., 2018). In implementing this approach, historical climate data are combined with location-specific crop and livestock information so farmers can assess risks. Decisions are made based on seasonal and short-term forecasts. Meetings will be conducted with farmers periodically just before the planting season and during the season. The PICSA approach aims at empowering farmers with information so that they can make informed decisions as they carry out their activities. A random sampling technique will be used to select farmers for study in each sub-region.

Meetings will be held with the local people in town centres to determine their vulnerability to climate change. Carefully designed questionnaires will be used as tools for data collection as well as focus group discussions. Key informant interviews will also be used as a data collection tool.

Based on the conversations/meetings with farmers, local town dwellers and key stakeholders, weather and climate information services will be generated and these will be made available to all the parties. These climate services are aimed at reducing vulnerability to environmental shocks and stresses and strengthening livelihoods (Hulme et al., 1992; Ingram et al., 2002).

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