



A Report on
Quantitative assessment of resilience factors in target communities in the Eastern Africa
Resilience Innovation Lab: A case for Uganda

Prepared for the Eastern Africa Resilience Innovation Lab (EA RILab)

By: Dr. Simon Kasasa (*The Lead Quantitative survey Consultant*)

Principal Investigator

Assoc. Prof William Bazeyo

Co-investigators

Dr. Simon Kasasa

Mr. Nathan Tumuhamy

Dr. Julius Ssentongo

Dr. Roy Mayega

Dr. Dorothy Okello

Ms. Grace Bua

Ms Christine Muhumuza

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Operational Definitions

- ***Adaptive capacity*** is defined as the combination of all the strengths, attributes and resources available within a community, society or organization that can be used to avert some or all of the negative effects of a shock or stress
- ***A shock*** is defined as a sudden occurrence befalling the communities, resulting in a significant challenge to their livelihood
- ***A stress*** is defined as a slow-onset or chronic occurrence befalling the communities, resulting in a significant challenge to their livelihood
- ***Physical infrastructure*** refers to build structures e.g. buildings, roads, bridges, schools, churches/mosques
- ***Resilience*** is defined as the capacity of people and systems to mitigate, adapt to, recover and learn from shocks and stresses in a manner that reduces vulnerability and increases well-being (RAN Definition)
- ***Risk*** is defined as the probability of suffering damage (to life, property, economic disruptions and environment) from a hazard for a given area and reference period.
- ***Vulnerability*** is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard

Executive summary

Introduction: Resilience is defined as the capacity of people and systems to mitigate, adapt to, recover and learn from shocks and stresses in a manner that reduces vulnerability and increases well-being (RAN 2015). By integrating resilience mechanisms into relief and development efforts, humanitarian and development practitioners seek to break the cycle of vulnerability and find locally identified and developed solutions for sustainability and positive impact in the communities.

Using a framework for resilience factors associated with climatic variability and prolonged drought, RAN community consultations and qualitative data, identified 8 dimension scales namely; wealth, health, agricultural practices, infrastructural status, human capital, psychosocial wellbeing, governance and social networks that interact with each other in order to influence communities' levels of resilience to various shocks and stressors. The communities are often hit by recurrent shocks and stresses caused by chronic conflict, climate variability, disease, and natural disasters which often overwhelm traditional coping mechanisms and create a corrosive cycle of fragility and risk. However, many African countries do lack clear evidence that can be used to monitor resilience indices. There are a number of government programs and humanitarian activities currently going in areas related areas, but these interventions need empirical evidence on resilience indices for a clear directions

A resilience survey was therefore designed to estimate baseline indicators of the drivers of vulnerability and adaptive capacity of the target communities to priority shocks or stresses as a basis for informing development of resilience dimensions and metrics so as to develop innovations that will result in improved resilience of the target communities.

Methods: A cross-sectional population-based survey was conducted in 4 Ugandan districts of Amuria, Bududa, Hoima and Lamwo between September and October 2015, where household interviews were conducted among household heads or their spouses aged 18 years and above who had lived in that area for atleast a year.

Multi-stage sampling taking into consideration rural/urban difference was applied starting from sub-county to an Enumeration Area (EA)/village, which was defined as cluster in this survey.

Completed questionnaires were double entered in CsPro (Census and Survey Processing System) version 5.0 by independent data entrants to ensure an error free dataset. Merged clean data files were then exported to STATA version 13.0 software for further cleaning and analysis. Major analytical tools included descriptive statistics in order to generate the baseline indicators. Principle Component Analysis (PCA) was then applied stepwise in order to obtain the most reliable combination per factor for all the 8 dimension scales. Since all the all dimension scale were measured on a continuous scale, linear regression models were therefore fitted based on the outputs dimension scales generated from the community consultations and qualitative research. Structural Equation Models (SEM) were also fitted to further explain all the pathways in the theoretical models. Results were presented in form of graphs and tables.

Results: A total of 2020 interviews from 140 EAs were conducted leading to 96% response rate. There were more male respondents (51%), median age was 38 years and majority (78%) were in union. Commonly reported stressors were; drought (74%), low prices (60%), crop pests (56%) and bad roads (55%). The data clearly show a clear pattern with the presence of assets like mobile phones, radio and mattress as likely measures of wealth in a household. Health dimension scale focused more on access especially living within a distance of 5km or spending up to 45 minutes to a health facility. Human capital was mostly described by education level, while social capital sources of support especially neighbors (31%) and family members (20%). For Agriculture dimension; a set of clustering occurred among households that keep livestock, poultry and producing grains or food crops. According to the data, close to 6 out of 10 respondents feel that local governments do not care about them. Although two thirds of the respondents had never paid for any free service in their community, majority of households reported that some corruption within the community.

SEM analysis clearly indicates a positive pathway between wealth dimension scale and other scales namely; governance, human capital, agriculture, infrastructure, health, social networks and psychosocial wellbeing. Apart from agriculture and social capital dimensions, the rest are statistically positively associated with health dimension scale.

Discussion: Understanding the context of these communities, mobile phones together with a radio in a household, plus owning a business and having access to loan opportunities were some of the strong cluster variables for the wealth dimension scale. Governance as an underlying factor was measured using community members' involvement in decision making, priority

setting and corruption. The two analysis methods clearly come-up with a negative relationship between wealth and governance dimension scales. The 2014 UNHS report used participation in leadership and voting as core factors for this scale. However, through other dimensions, good governance also shows a positive relationship with a high wealth score.

Based on infrastructure dimension scale, households that reported improved bridges/roads and living closer to them were positively associated with better wealth score. This probably helps such households to incur low transport cost but also easy means of transport to the markets.

Household members who were exposed to formal education were positively associated with a high wealth score than those with no education. The data clearly brings out the importance of education as one of the tools to use in improving households social economic status.

Involvement in crops and animal husbandry, application of fertilizers to soils, using better means of preserving crops and access to agricultural extension services were also among the predictors of a good wealth scale under the agriculture dimension scale.

In reference to human capital, linear regression outputs clearly indicate a positive relationship between wealth and households that seek help from neighbors in case of a shock compared to those who go to other places such as police, church and NGOs. These data clearly indicate that during shocks, most members seek support from neighbors mostly. This implies that keeping communities in good relationship is one of the pillars that make them resilient to shocks and stresses.

The data clearly indicates that, in the presence of good governance, the remaining 4 dimension scales are good predictors of better wealth in those communities. Improving household social economic status should always consider all the important dimensions in that particular community. This calls for community engagements at various levels before initiating any development program.

1.0 Introduction and Background

1.1 Introduction

Sub-Saharan Africa has continued to enjoy unprecedented rates of economic growth, with new technologies, better governance, and increasing investment flows creating new opportunities for innovation, economic and human development. However, over the past few decades, the burden of disasters has been on the increase (ECHO, 2013). Human factors underlie most disaster situations, contributing to either their causes or effects. Disasters often result in sudden shocks that disrupt the livelihoods of communities, infrastructure and institutions (UNISDR, 2009). Even without sudden events, communities face slow-onset and persistent stresses that affect their wellbeing and resilience.

The Resilient Africa Network (RAN) defines resilience as the capacity of people and systems to mitigate, adapt to, recover and learn from shocks and stresses in a manner that reduces vulnerability and increases well-being (RAN 2015). By integrating resilience mechanisms into relief and development efforts, humanitarian and development practitioners seek to break the cycle of vulnerability and find locally driven solutions to better ensure more sustainable and effective impacts.

The factors that affect resilience can be viewed as primary and underlying causes of vulnerability, drivers of vulnerability as well as factors that drive adaptation. These factors were studied by RAN during the community consultations and this quantitative assessment will foster a better understanding and measurement of the resilience dimensions, especially the underlying factors that make people trapped in vulnerability as well as the factors that promote adaptation.

1.2 Background

While many frameworks have been used to assess resilience, there is no unifying framework for understanding resilience in sub-Saharan Africa. This is partly attributable to the fact that resilience is latent, dynamic and multidimensional. The Resilient Africa Network (RAN) is in the process of developing a framework for understanding, measuring and monitoring resilience in vulnerable communities in sub-Saharan Africa. However, this requires a clear understanding of the dimensions of resilience in the geographical areas of focus for the program (RAN 2015).

Although RAN's regional partners have each proposed priority themes and geographical areas of focus for resilience interventions, there is an insufficient understanding of the range of vulnerability factors and underlying drivers of vulnerability and adaptive capacities of the target communities. The network proposed five systematic steps for all the member countries to follow while developing a framework for measurement of resilience in the specific contexts. These include:

- I. Context analysis (Resilience of Whom?); through literature review to identify priority themes and geographical areas of focus for its resilience programming.
- II. Qualitative assessment (Resilience to what?); this was used to identify dimensions of resilience. This step helps further to develop indicators and tools for measuring resilience to the priority issues of focus in the respective communities.
- III. Surveys of resilience; where tools generated during qualitative assessment are then used to measure the baseline status of the various resilience factors in the target communities. Surveys have to be conducted repeated periodically in order to assess trends in resilience indicators in the target communities.
- IV. Resilience Innovations: where the identified problems are taken to Universities to facilitate the ideation, development, incubation, and testing.
- V. Evaluation; where quantitative and qualitative methods shall be applied in order to assess the impact of resilience innovations on indicators in the targeted communities.

The Eastern Africa Resilience Innovation Lab (EA RILab) has already concluded a qualitative assessment of the ecology of resilience in seven target communities in three countries (Uganda, Rwanda and DRC). Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted and indicators plus tools for measuring resilience to the priority issues of focus in the respective communities have already been generated (RAN 2015).

The quantitative assessment is a third step in RAN's systematic steps listed above that has to follow in order to generate quantitative baseline indicators based on thematic areas from the qualitative assessment.

2.0 Literature Review

2.1 Shocks and stresses in the Eastern Africa region

The Eastern Africa region is prone to many adverse events (Toole and Waldman 1993) that manifest either as sudden shocks or chronic stresses in different communities. The region's location and climate interact with several human factors to provide optimum conditions for occurrence of epidemics, floods, drought and famine and other natural stresses (USAID 2010; USAID 2011) as well as environmental degradation, acute and chronic conflict, terrorism, fires and transportation crashes (Office of the Prime Minister 2004). Rapid population growth, and the increasing urbanisation have contributed to the increase in disaster hazard risk and socio-economic stresses in the region (UBOS 2012). Lack of livelihoods diversification in many communities results in persistent poverty that exacerbates the effects of other shocks and stresses.

A formative literature review resulted in the identification of four priority issues of focus for target communities in Uganda: 1) Resilience to recurrent epidemics and floods as a result of climate variability in the Albertine region; 2) resilience to recurrent floods alternating with drought as a result of climate variability in the Teso region; 3) resilience to recurrent landslides and floods as a result of climate variability in the Elgon region; and; 4) resilience to the effects of chronic conflict on livelihoods, manifested in the slow pace of socio-economic recovery in northern Uganda. These four priorities have been summarized into two priority thematic issues: 1) Resilience to the effects of climate variability; and 2) Resilience to chronic conflict and/or its effects. In this section, we provide a review of literature on the manifestations of the priority thematic areas of focus for selected communities in Uganda.

2.2 Resilience challenges for Uganda

Uganda is a landlocked country in East Africa covering 243,411 sq. Km. The presence of numerous water bodies and a humid sub-tropical climate is both a resource and a potential source of climate and environment related stresses. In addition, because it is bordered by countries with active or recent conflict, Uganda hosts a large refugee population (AfricanStudiesCentre 2013).

Uganda's population was projected at 34.1 million people in 2012 (UBOS 2007) and with an annual growth rate of 3.4% and a total fertility rate of 6.2 children per woman is one of the fastest growing populations in the world (UBOS 2012).

The major economic activity in Uganda is agriculture and over 70% of the population is employed by this sector (UBOS 2007). However, the majority of farmers depend on small subsistence-based holdings. The associated lack of livelihoods diversification often results in income poverty and food insecurity especially because traditional food crops are increasingly doubling as cash crops. Uganda's GDP per capita (on a purchasing power parity basis) stands at 1400 USD (Source: World Bank). Uganda's GDP composition by sector is as follows: Agriculture: 24.3%; Industry: 25.5%; and Services: 50.3%. Uganda's non-income Human Development Index stands at 0.511, ranking it 161st globally. (The index is a composite of three main variables: Health, Education and Income). Uganda's life expectancy at birth has improved over the years to 58.7 years. The average years of schooling (for adults) is only 4.7 years while the GNI per capita (in PPP terms) stands at 1,168 USD. The Inequality adjusted HDI value stands at 0.367, the Gender Inequality Index at 0.517 and the Multi-dimensional Poverty Index at 0.367 (All figures quoted from the UNDP).

Uganda is faced with a number of shocks/stresses that affect the resilience of communities of which RAN has identified 4 priorities (recurrent floods and landslides as a result of heavy rains in Mt Elgon region, recurrent floods and drought in Teso regions, Epidemics and floods in Albertine region and the effects of chronic war in the Northern region). These priorities align under RAN's two thematic areas of focus: 1) Resilience to the effects of climate variability in the region; and 2) Resilience to acute and chronic conflict and/or its effects in the region. A review of the two thematic priorities for Uganda is presented in 4 case studies below:

2.3 Resilience to the effects of the chronic conflict in Northern Uganda

Northern Uganda was devastated by a 20-year armed conflict from 1986 to 2006 (Otunnu 2002; OPM 2007). The most affected areas were Gulu, Kitgum and Pader districts (Acholi region), with spill-overs into Lira, Otuke and Aleptong districts (Lango region) (ACF 2010; ACF 2010; Bozzoli, Brück et al. 2012). The conflict led to loss of lives in the magnitude of tens of thousands

of people and loss of economic self-determination for hundreds of thousands more (Otunnu 2002; OPM 2007). Over two million people were left internally displaced; this level of displacement has been reported to be one of the highest in the world (Jens Claussen and Nordby 2008; UNDP 2010). Another primary effect was child abuse and child neglect. Over 50% of the insurgents' militia was made up of children who were abducted and forced to commit atrocities. Others were defiled and forced into teenage marriage to the militiamen (UN ; Opprann 2009; Annan and Brier 2010; Gagne 2011; Cecilie Lancken 2012).The insurgency also led to a phenomenon known as 'night commuting' whereby tens of thousands of children would walk up to 8kms at night for protection in the urban areas (UNICEF 2005; OPM 2007).

The secondary effects of the civil war included: A loss of socio-economic and livelihoods resilience, a breakdown in social-cultural networks and value systems, an increase in sexual and gender-based violence, an increase in psychological disorders including PTSD, suicide and despair, poverty, food insecurity, breakdown in infrastructure, health effects such as increase in prevalence of HIV/AIDS, deadly epidemics and morbidity and mortality due to preventable diseases, decline of health systems and other social services and land disputes (ISIS-WICCE 2001; Otunnu 2002; Akumu 2005; OPM 2007; Kinyanda 2010).The war also resulted into orphanhood which further exposed the already vulnerable children to inequity and violence due to lack of social safety nets from the community (Oleke, Blystad et al. 2006). Poor health/morbidity due to lack of access to medical/psychological services further increased vulnerability (Kinyanda, Musisi et al. 2010).

The most vulnerable groups were women and children who faced severe physical and psychological health issues, which continue to have negative implications on their lives (Corbin 2008). The factors that make people, infrastructure and institutions vulnerable to the effects of civil war include: lack of education since they are not empowered to build capacity for resilience, lack of livelihoods diversification, and loss of socio-cultural controls. Being in IDP camps led many parents to relinquish their responsibilities to institutions and NGOs (Angucia, Zeelen et al. 2010).Lack of dependable physical space prevented people from making positive life changing interactions; this created individualism in the community (Angucia, Zeelen et al. 2010).Gender was also an important factor; being female exposed women to sexual violence (Kinyanda, Musisi

et al. 2010). The poor condition in the IDP camps led to appalling sanitation and hygiene, loss of privacy, dignity, massive overcrowding and malnutrition (UPFI). Many of these effects have persisted beyond the conflict. Cattle raiding also increased vulnerability of communities since it led to loss of their livelihood (OPM 2007). The delays in detection, response, and containment of the various problems that resulted from the conflict, made the population vulnerable to the effects of the civil war (Angucia, Zeelen et al. 2010; Kinyanda, Musisi et al. 2010). Another key effect of the situation was the growth of reliance on Government and donor aid which includes Food and non-food items – this resulted in a situation where a large section of the population was trapped in ‘victimhood and dependency’, losing a large part of their self-dependency.

Among the adaptive and coping strategies have been numerous programs for recovery. Civil society organizations and international agencies have been at the fore-front of these programs that have included re-settlement of formerly displaced persons from the camps back to their homes, economic recovery programs (including promotion of farming and agri-business, restocking, and other economic incentives). There have also been numerous programs to support the revamping of social services (including water, health and education). At the community level, there have been efforts at re-establishing social cohesion and cultural controls. The communities have sought both physical and emotional support from family, friends, social groups and humanitarian organizations, enlightening the world about their situation using photography, story-telling, chanting, dancing, songs, theatre, and writing, as a way of rebuilding their lives (Edmondson 2005; Mark Sommer 2011). They have also been seen to use cultural and religious coping strategies, which studies have reported as contributing to the counteracting of vulnerabilities (Murthy and Lakshminarayana 2006).

However, despite all efforts at reconstruction, the pace of recovery has remained slow since the end of the war in 2004. Data from serial Demographic and Health Surveys (UDHS 2001, UDHS 2005 and UDHS 2011), as well as the AIDS Indicator Surveys (AIS 2004 and 2012) show that the Northern region has the lowest socio-economic indicators compared to all other regions of Uganda. There is need to explore further the factors that have kept this region trapped in slow recovery. There is also a need to explore the effect of the conflict on the resilience of communities to various livelihood variables.

2.4 Recurrent landslides and floods in the Elgon region

Eight districts in the Mt. Elgon region are prone to landslides/mudslides including Kapchorwa, Kween, Bukwo, Bududa, Bulambuli, Sironko, Mbale and Manafwa districts (URCS 2012). However, Bududa and Manafwa face the greatest burdens from the effects of these landslides. The landslides are triggered by the long and persistent rainfall (Kitutu 2010). In Bududa, landslides/mudslides have occurred in the sub counties of Bulucheke, Bubita, Bushika, Bududa and Bushika (Kitutu, Poesen et al. 2011). The landslides are triggered by heavy rains. However, districts in the lower lying areas in the region are prone to flooding, especially the lower areas of Manafwa and Butalejja districts. This results from flow of rain water and silt from the highlands to the river beds in the lower lands. Heavy silting and large volumes of water often cause the rivers to burst their banks.

The primary effects of the landslides and floods include economic and livelihoods loss, loss of lives and displacement. The major landslide of 2010 claimed 400 lives, buried three villages instantly and several others sustained injuries (Kato and Mutonyi 2011; Atuyambe et al 2011). There is also destruction of farmland and livestock, property, businesses and roads, schools and health facilities, among others. This leads to loss of livelihood and shortage of food (Kitutu, Poesen et al. 2011) increasing households' susceptibility to famine, malnutrition and poverty (Juventine 2012; Atuyambe et al 2011). Among the Secondary effects was resettlement of about 8500 displaced people into Internally Displaced Peoples' (IDP) camps in Kiryandongo camp (Atuyambe, Ediau et al. 2011). Other secondary effects included land conflicts, post-traumatic stress disorder, the outbreak of diseases (DDMC 2012).

The factors that make people, infrastructure and institutions vulnerable to the effects of landslides and floods include: living on hilly areas or on slopes (for landslides), or in the flood plains (for floods). The Mt. Elgon slopes are very fertile and this has caused an increase in human population and forced many people to utilize even the most landslide-prone areas (Kato and Mutonyi 2011). Other factors cited are: lack of education on the causes and mitigation measures that one can use to reduce the effects of landslides; instability of slopes, age where the young and the elderly are more vulnerable. Gender also increases vulnerability among women

and especially in female headed households. Furthermore, the nature of the houses built with wood and wattle walls are prone to collapsing in the event of a landslide and poor level of preparedness in the district (Juventine 2012). Slow un-monitored silting of river confluences led to the flooding in Butalejja in 2010.

The drivers of vulnerability include: the strong socio-cultural beliefs which has a strong influence on people's ability to change behaviour to cope and mitigate the effects of the landslides and floods (Atuyambe, Ediau et al. 2011), the high population density that leads people to encroach on mountain slopes. Furthermore, poverty resulting from the destruction of crops and farmland yet Agriculture is their major source of livelihood (Juventine 2012). The adaptive factors among the affected communities consist of reliance on external assistance from the government and volunteers who respond immediately through provision of emergency interventions in the areas of water, sanitation, hygiene and health services promotion (IFRC 2013). Another important adaptive mechanism was the resettlement of displaced populations after the landslide/mudslide occurred to minimize further damage to lives and property. Continued sensitization and public awareness of the community on effective preventive measures was also conducted by various agencies to help cope with the effects of the disaster.

From a resilience perspective, the floods and landslides that have occurred repeatedly in this region are predictable, with a strong relation for climate variability (heavy rains) as well as the settlement patterns of the population in these districts. Government and civil society have tried a number of mitigation strategies and policies, including voluntary and mandatory relocation of most affected persons and implementation of policies against encroachment on high risk areas but the responsiveness of communities have been sub-optimal. There is need for exploration of the latent factors that promote persistence of settlement in high risk areas and how these can be mitigated.

2.5 Recurrent floods and drought in Teso Region

The Teso region, located in north eastern Uganda comprises of the districts of Soroti, Kumi, Katakwi, Amuria, Kaberamaido and Bukedea districts. It is bordered by Karamoja in the north, Lira in the west and Mbale in the south.

The main shocks/stresses in this sub-region include: recurrent floods in one part of the district and recurrent drought in the other. Floods are often due to the prolonged and heavy rains while drought is due to long dry seasons. It has been noted that the patterns of floods in Uganda have been changing, becoming more frequent, intense and unpredictable especially to the local communities. Major flooding occurred in 2007 and 2010(NUDC 2012). The most vulnerable populations as in any disaster are the women and the children. Drought mainly occurs in the Northern parts of Teso region, especially in Katakwi and Amuria districts. (NAPA 2007).

The primary effects of flooding in the region include: Loss of livelihoods, loss of lives, displacement of people like in the 2007 floods that left over 143000 people displaced (NUDC 2012); massive destruction of crops and crop failure and destruction of infrastructure like bridges, roads, buildings; blocked urban drainage and flooded latrines in schools and buildings and contamination of water sources (NUDC 2012). The secondary effects of flooding are experienced in different sectors like health and transport. In health, flooding results into increased breeding of vectors and water contamination leading to outbreak of diseases(Bambaiha 2009). It also leads to food insecurity as crops are destroyed and food prices also increase (Rukandema, Ameziane et al. 2008) hence famine and malnutrition with lower productivity and a reduced ability to learn/concentrate in class. The main primary effect that results from drought include: water unavailability and food shortage while the main secondary effects include: food insecurity, conflict, mortalities, malnutrition, displacement of people, migration and loss of human life (FAO 2011).

The factors that make people, infrastructure and institutions vulnerable to flooding include: Topography especially in Amuria and Katakwi which lie on a flat terrain covered by swampy areas and serve as catchment area for all water flowing from neighbouring districts in Karamoja region, especially because region has vast low lands and swampy areas, yet it is surrounded by mountainous regions. The nature of the permeable soils makes flooding inevitable(Rukandema, Ameziane et al. 2008). Age is also another factor as children and the elderly are most affected and Gender where women are more vulnerable than men and especially the female headed households. Other factors include: Inadequate awareness in addressing the impact of floods

(Bambaiha, 2009); Lack of evidence based planning of programmes that target climate related impacts (ACCRA 2010). There is also increased encroachment on wetland/swampy areas due to population pressure. The factors that make people, infrastructure and institutions vulnerable to drought include: natural variability in climate, with inadequate mitigation measures, lack of economic diversification, lack of rainfall that is triggered by deforestation and the extraction of water or the drying of wetlands, climate change, as well as lack of awareness. The underlying vulnerability factors towards floods and drought are: poverty, lack of livelihoods diversification, poor access to early warning data, poor methods of agricultural production and lack of access to improved seeds. (Rukandema et al., 2008). Others include a widening inter-generational gap between those who know and use indigenous knowledge and the younger generation that is indifferent (Egeru 2012).

Households in Teso region respond to shocks related to floods and water stress by: reducing consumption, using past savings, technology and borrowing (Hisali, Birungi et al. 2011), harvesting wild fruits and vegetables (Egeru 2012), climate extension services and climate information (Ekiyar et al., 2012). In Teso, people use indigenous knowledge to detect drought and keep sowing and planting in the hope that rain will come and stay. Tree planting of fast maturing varieties is also done (NAPA, 2007). The Teso people also depend on government and other development partners to cope with the adverse effects of the floods and water stress through provision of emergency interventions in agriculture, agro-forestry, health and social services (ACCRA 2010; Ekiyar, Jumbe et al. 2012).

While floods and drought are recurrent in the region, the capacity of communities to mitigate or eradicate their effects has been sub-optimal. This is despite a number of interventions by government and civil society organisations that have targeted this region. There is need for a further exploration of the underlying drivers of resilience to floods and drought in the region.

2.6 Recurrent epidemics and floods in Albertine region

The Albertine region lies along the Lake Albert and River Nile in the mid-western end of the country, and the region comprises of the following districts; Nebbi and Zombo in the north, Hoima and Kibale district in the west and Kasese district in the southwest. The region suffers

recurrent floods and landslides due to heavy rains. These have far reaching impacts to the affected areas escalating recurrent epidemics of cholera, malaria, and viral haemorrhagic fevers.

Floods: After heavy rains that lasted for six hours on the 1 May 2013, River Nyamwamba burst its banks and flooded nine sub-counties in Kasese namely; kyabarungira, malaba, bugoye, kitswamba, kilembe, kasese TC, karusandara and kyarumba. Eight people were confirmed dead and five people went missing. It is reported that the affected population as a result of this shock stood at 25,445(IFRC 2013).

Landslides: Kasese district has experienced landslides in 2005, 2010 and 2011. These have caused destruction of property but with no deaths reported (DesInventar downloaded on 22 June 2013).

Epidemics: Cholera has recurrent for a long time in this region (IFRC 2012). In the recent catastrophes, reports from the ministry of health epidemiology and surveillance department indicated that since the beginning of 2013 the cumulative number of cases reported from the cholera affected Hoima, Nebbi, Buliisa districts has reached 216 cases and 7 deaths. The overall case fatality rate nationally from these districts stood at 3.2% (IFRC 2013). The region is also at risk for Ebola, Dysentery and other epidemic prone diseases.

The Primary effects of these stresses/shocks included destruction of infrastructure and property due to flooding (IFRC 2013). Water sources are also destroyed and contaminated, in addition there is displacement of home steads due to loss of property and break up of families. Morbidity and mortality due to cholera outbreaks is experienced in the region (Alajo, Nakavuma et al. 2006). Secondary effects of these shocks/stresses include, increased government expenditure on diseases outbreaks and evacuation and resettlement of victims.

Factors which increase vulnerability of communities are: lack of effective climate change preparedness programmes (Bambaiha 2009), persistent heavy rainfall leading to floods, water bodies hence a high water table, inadequate outbreak preparedness and response mechanisms like the weakened surveillance system (Namusisi 2007). Other factors may include: inadequacy of sanitary facilities in the community coupled with poor hygiene predisposing communities to cholera epidemics (IFRC 2012). Inadequate/ lack of knowledge on cholera is another factor

(Namusisi 2007). The underlying factors that make people fail to overcome vulnerability include: Absence of policy documents relating climate change and human health (Bambaiha 2009) hence the districts lack a guide on the way forward, beliefs among the fishing communities along the lake shores that the cholera is air borne and caused by witchcraft (IFRC 2013). Cross border movements between Uganda and Congo facilitate the quick spread of cholera(IFRC 2012). Further more, the soil texture in some flood affected areas poses a big challenge in improving the latrine coverage in these areas (IFRC 2012).Resistance to first line antibiotics and hence propagators of the cholera re-occurrence (Okui 2008).

The adaptive factors with in communities in the Albertine region include reliance on external and government assistance that provide interventions in health, agriculture and water (IFRC 2012). The sub-county authorities also enacted by-laws stopping sale of cold foods and fluids associated with the spread of the disease (IFRC 2013).Mass media and information dissemination, education and communication (IEC) materials in the form of context specific posters, brochures and t-shirts in the local languages (IFRC 2013) are used to increase awareness.

There is need to explore the reasons why communities in the region repeated suffer from preventable effects of floods and recurrent epidemics despite their predictability especially in the rainy seasons.

Table 1: Resilience dimensions and variables identified during RAN community consultations

Dimensions of Resilience	Variables						
	Variables 1	Variable s 2	Variable s3	Variables 4	Variables 5	Variable s 6	Variable s 7
Wealth	Employment status	Wealth Index/Household items	Economic activities of household members	Other sources of income-Non Agricultural generating activities	Funding for Non Agricultural generating activities	Access to savings, loans/credit	
Agriculture	food/livestock production/agricultural activities	Agricultural markets	Price fluctuations	Soil and water	Agricultural inputs	Post-harvesting handling	Extension services
Health	Health Well being	Distance to health facilities	Time taken to reach the health facility	Water access	WASH	Health insurance	Perception on the quality of health services
Human capital	Education of household members	school dropouts	Labor force	technical/vocational institutions	Access to education services		
Community networks/social capital	Support from relatives, friends & neighbors	Support from host families	Community groups				
Governance	Perception on government decision making	Corruption	Service delivery	Land issues under governance			
Infrastructure	Water sources/access (several specific indicators)	Road access	status of roads/bridges	Maintenance of roads/bridges	Housing Conditions	Energy use	
Psychosocial	self-rating of overall Wellbeing	satisfaction with life	Confidence in settling personal problems	Stress management	Optimism	Relating with other people	

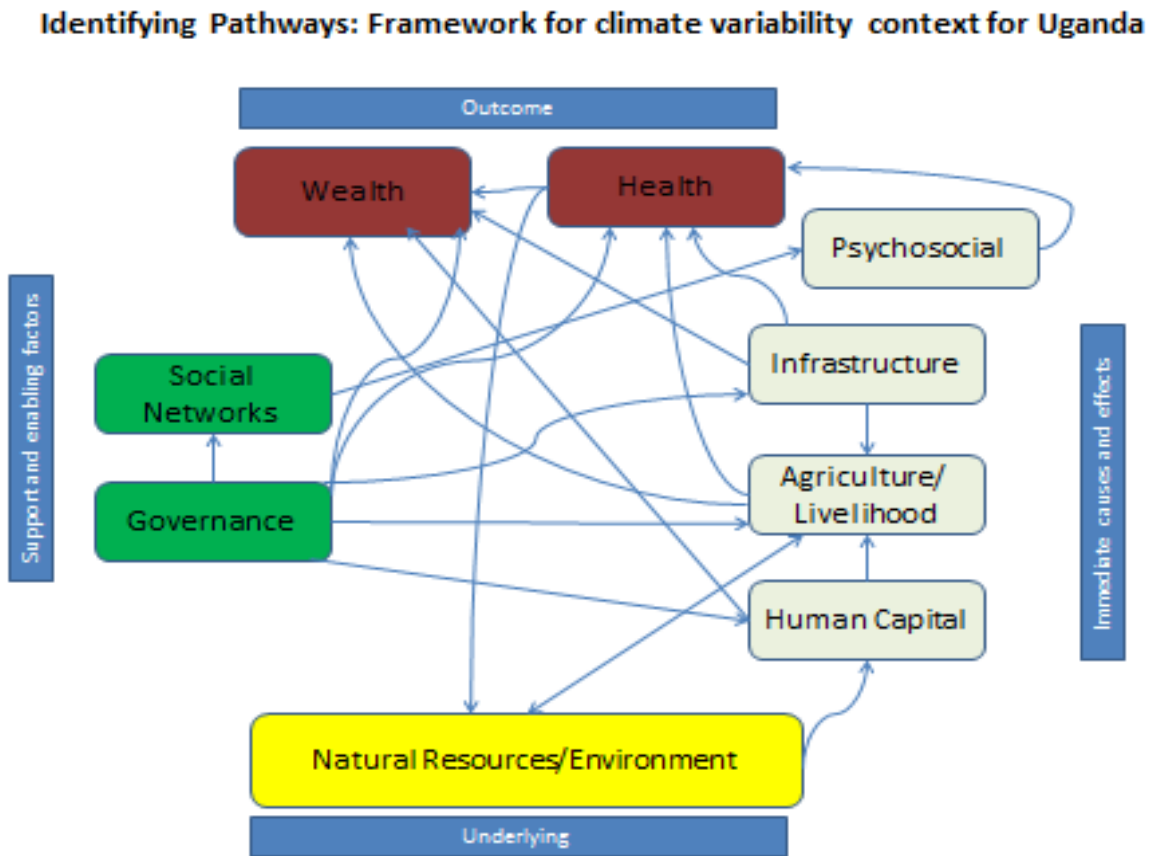
3.0 Statement of the Problem and Conceptual Framework

3.1 Statement of the problem

While many frameworks have been used to assess resilience, there has been no unifying framework for understanding resilience in sub-Saharan Africa. Through community dialogue (FGDs and KIIs), ResilientAfrica Network has developed a framework for understanding, measuring and monitoring resilience in vulnerable communities in sub-Saharan Africa (RAN 2015). This framework has provided a qualitative understanding of the range of vulnerability factors and underlying drivers of vulnerability and adaptive capacities of communities. However, there is inadequate quantitative data on the underlying drivers of vulnerability and adaptive capacities of communities affected by different shocks and stresses.

There is therefore an urgent need to measure and benchmark indicators that are key to understanding the drivers of vulnerability and adaptive capacities in the target communities, to enable a better understanding of resilience in the priority thematic areas (chronic conflict and climate variability). The Eastern Africa RILab seeks to conduct a quantitative assessment of the ecology of resilience in the four districts of RAN target communities in Uganda.

Figure 1: Conceptual framework for resilience factors associated with climate variability in selected districts in Albertine, Teso and Mt. Elgon sub-regions in Uganda



Adapted from the RAN State of African Resilience Report (RAN 2015)

Narrative

The resilience framework above represents the relationships and interactions between the nine dimensions (*Infrastructure, Human Capital, Wealth, Governance, Natural Resources/Environment, Agriculture, Health, Social Environment/Social Networks and Psychosocial Wellbeing*) that the qualitative analysis of data from Teso, Elgon and Albertine sub-regions affected by climate variability in Uganda. From these data, *Wealth* and *Health* emerged as key dimensions and were thus considered at the outcome level. *Governance* and *Social Environment/Social Networks* were identified as enabling dimensions that influence and support the dimensions of *Human Capital, Agriculture, Infrastructure and Psychosocial Wellbeing*.

The underlying driver of resilience to adverse climate in this context appears to be environmental factors (Figure 1), including adverse climate events, degradation, productivity of the soil and conservation. The communities surveyed depend on subsistence agriculture as their main source of livelihood and hence wealth. Any destruction of natural resources (soils, vegetation) by adverse climate change effects (floods, drought, landslides) or human activity such as through agriculture affects their livelihoods and makes them vulnerable. Topography, human activities, geological factors (e.g., the nature of soils) and population pressure are some of the underlying vulnerability factors affecting this dimension. The increasing shocks and stresses affect the school infrastructure hence affecting the education which has an impact on human capital.

The second level in the diagram consists of *Psychosocial Wellbeing*, *Human Capital*, *Agriculture* and *Infrastructure*, which are the immediate causes/effects of the two outcomes (*Health* and *Wealth*). In the communities surveyed, the occurrence of shocks or stresses such as landslides, drought, floods or disease epidemics can affect the dimensions at this level and can be manifested as the loss of entire crops, an increase in crop pests and diseases and loss of transport infrastructure, among others.

Psychosocial Wellbeing as an immediate cause relates to the attitude, mindset or behavior of a community. The communities surveyed had a negative attitude and behaviors that facilitated destruction of the environment and a poor response to mobilization and sensitization campaigns aimed at conserving or improving the environment. This ultimately affects the health and wellbeing of communities and individuals.

Human Capital includes interventions that develop the capacity of individuals to achieve their full potential. Youth were reported to have dropped out of school and were unproductive and engaged in gambling and drug abuse. This ultimately has an impact on wealth.

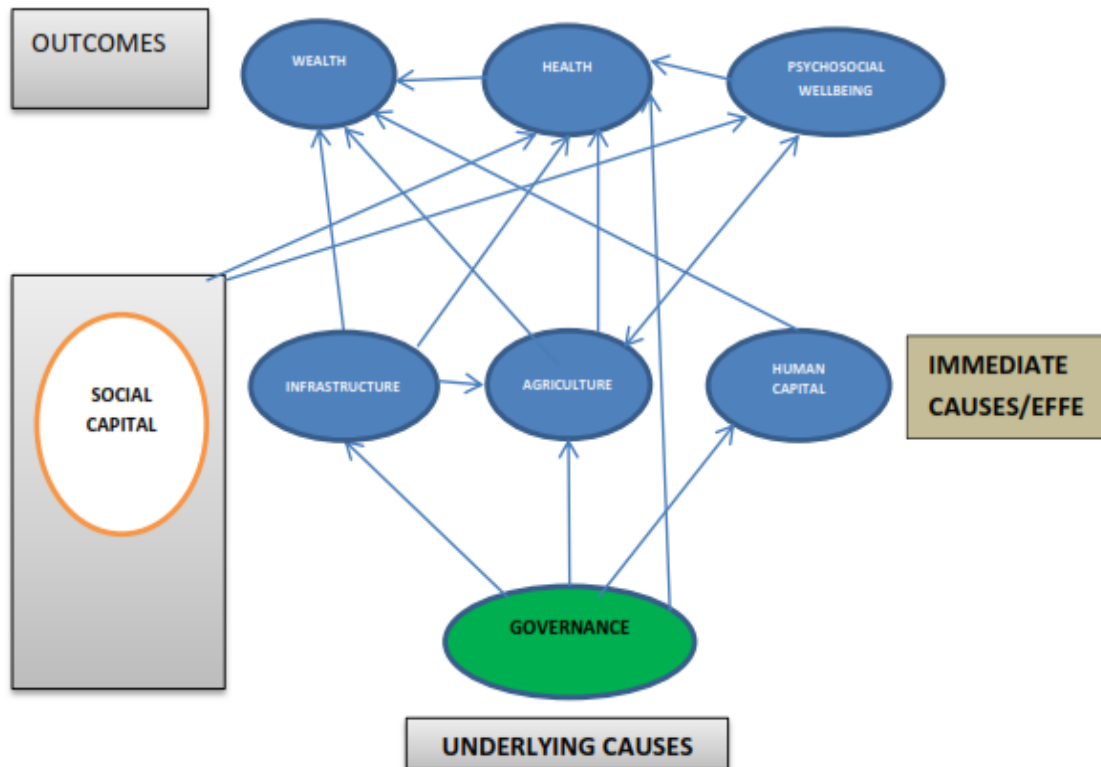
The *Agriculture* and *Infrastructure* dimensions resilience dimensions since majority of the communities in Uganda depend on farming. They thus interact with each other to influence wealth and health. For instance, communities reported poor access to local markets to sell agricultural produce due to the breakdown of the infrastructure as a result of shocks and such as floods and landslides. Community members also expressed their disappointment in several agricultural inputs (e.g., seeds that have low yields and cannot be replanted, lack of machinery on the farm; exhausted, infertile soil and “fake” fertilizers), as well as skewed markets that favor

the middlemen, low prices for farmers; produce and poor road networks hindering produce transport.

Governance and *Social Environment/Social Networks* are the factors/dimensions that were viewed as enabling achievement of the desired outcomes (health and wealth). Broadly, *Governance* is important in the delivery of education (human capital), infrastructure development as well as investments in agriculture. These interactions ultimately affect both health and wealth.

Social networks such as savings groups and host families provide psychosocial support in the event of a disaster.

Figure 2: Conceptual framework for resilience factors associated with the socio-economic debacle following decades of conflict in Northern Uganda



Adapted from the RAN State of African Resilience Report (RAN 2015)

Narrative:

The framework (Figure 2) highlights that three key dimensions (Psychosocial Wellbeing, Wealth and Health) appear to be at the outcome level. This is not surprising for northern Uganda which is a community that had been hit by a long-standing conflict. In this context, alternative livelihoods, psychosocial support and improved health services were identified as important parameters to achieve fast recovery after conflict. In order for this community to realize the desired outcomes, there is a need to invest in infrastructure, improve the agricultural sector and invest in human capital, as shown by the linkages in the framework. The key enabling factor in this context appears to be Social Networks/Social Capital and establishing a social environment characterized by sharing experience with trusted friends, forming support groups, harnessing cultural practices and actively engaging religious institutions in promoting reconciliation.

In the context of northern Uganda, the conflict had severe impacts on socio-economic and livelihoods resilience and resulted in a breakdown in social-cultural networks and value systems; an increase in sexual and gender-based violence; an increase in psychological disorders including PTSD, suicide and despair; poverty; food insecurity; breakdown in infrastructure; health effects such as increased prevalence of HIV and a decline of health systems; limited engagement in productive agriculture and other social services; and land disputes.

Governance appeared to be the key underlying factor towards the escalation of the conflict in northern Uganda. The chaos during the conflict led to destruction of several infrastructures. For instance, a lot of schools were burnt down and there were sever school dropouts which consequently affected the level of human capital. Due to the encampment, the agricultural sector was also hit as there was no production. When the war was over, there was a continued dependence syndrome on aid with low productivity on the farm. Other governance-related issues cited in this community were corruption, land disputes and lack of access to social services. Communities reported that a high level of corruption at all levels of government, especially in settling land disputes, caused divisions among the local people. This has exacerbated the community's capacity to recover after the conflict and has had a direct bearing on wealth and livelihood. The communities surveyed are dependent on agriculture and therefore any loss of land can be devastating.

Infrastructure, Agriculture and Human Capital: As a result of the conflict in northern Uganda and the poor governance state that ensued after the conflict, there has been a lag in attaining a wealth status by most communities. There was limited engagement in productive work after the conflict and the education system was non-functional. All these have an impact on wealth which was one of the ultimate outcomes for the communities surveyed in northern Uganda.

Due to the damage of the infrastructure due the war, both the wealth and health services were affected. Communities lacked access to markets due to the damaged infrastructure, this the agricultural sector was affected.

Agricultural sector was also affected by the psychosocial wellbeing of the communities as most people were depending on aid and hence low productivity on the farm.

This study is therefore assessed the resilience indicators in the RAN target communities in northern Uganda.

4.0 Objectives of the survey

4.1 *General objective*

The general objective of resilience survey was to estimate baseline indicators of the drivers of vulnerability and adaptive capacity of the target communities to priority shocks or stresses as a basis for informing development of resilience dimensions and metrics so as to develop innovations that will result in improved resilience of the target communities.

4.2 *Specific objectives*

The specific objectives of this assessment were:

1. To assess dimension specific resilience factors in the RAN target communities in Uganda
2. To determine benchmark dimension-specific data for measuring success of resilience innovations in the RAN target communities
3. To assess the inter-relationships between the resilience dimensions so as to identify opportunities for leverage during innovation development in the RAN target communities

5.0 Methods and Materials

5.1 Study design

This was a cross-sectional population-based study that was conducted to measure livelihood related resilience indicators among households affected by drought, floods/disease epidemics, landslides and conflict in the districts of Amuria, Hoima Bududa, and Lamwo respectively. Field work was carried out in September and October 2015. Household heads, spouses or a representative above 18 years were interviewed for this survey.

5.2 Inclusion and exclusion criteria

The inclusion criteria for the study considered, households within the selected census districts/Enumeration Areas (EAs), Individuals at least 18 years of age and only residents who had spent at least a year in the study area. The survey considered also 2 exclusion criteria namely, refusal to participate and respondents who were sick or incapable of responding to the survey questions.

5.3 Study areas

The study areas included communities where RAN targets to monitor change in resilience factors over time, and to test hypotheses about the effectiveness and efficiency of proposed interventions on individuals, households and communities. One district was randomly selected in each of those 4 regions. These are the same communities where qualitative analysis was also conducted and below is a summary of their special characteristics.

- Albertine region in Western Uganda (Kasese, Nebbi and Hoima districts), where the main issue is '*strengthening resilience to recurrent epidemics and floods as a result of climate variability*'.
- Teso region in Eastern Uganda (Soroti, Katakwi and Amuria districts), where the main issue is '*strengthening resilience to recurrent floods alternating with drought as a result of climate variability*'
- Elgon region in Eastern Uganda (Bududa, Butalejja and Manafwa districts), where the main issue is '*strengthening resilience to recurrent landslides and floods as a result of climate variability*'

- The Northern region (Pader, Lira and Lamwo districts), where the main issue is *‘resilience to the effects of chronic conflict on livelihoods, manifested in the slow pace of socio-economic recovery in the region’*.

5.4 *Sampling and sample size estimation*

The sample was designed to provide household livelihood and other resilient indicator estimates for the above districts. In order to increase the efficiency of the sample design, the sampling frame was divided into strata which were as homogeneous as possible. . The first level of stratification generally corresponds to the districts.

A two stage sampling design was used to draw the sample. At the first stage, Enumeration Areas (EAs) (clusters) were drawn with Probability Proportional to Size (PPS), and at the second stage, households which were the ultimate sampling units were then drawn using Simple Random Sampling (SRS). A total of 2111 households out of 140 clusters were selected using 2014 Uganda Population and Housing Census after adjusting for a 10% non-response rate (UBOS). At the EA level, the survey targeted 15 randomly selected households. The Table 2 below summarizes the number of EAs and anticipated households from each district as per the sample size computation which was computed in consultation with the UBOS team.

Table 2: Sample size estimation per district

District	EAs/Clusters	Cluster size	Adjusted HH sample
Lamwo	17	15	253
Bududa	36	15	544
Amuria	36	15	544
Hoima	51	15	770
TOTAL	140		2111

5.5 *Sampling frame*

The sampling frame that was used for survey was based on the 2014 Population and Housing Census provided by the Uganda Bureau of Statistics (UBOS). The UBOS has an electronic file consisting of 78,950 Enumeration Areas (EAs). An EA is a geographic area consisting of a convenient number of dwelling units that serve as counting units for the census. . Twenty two percent of the EAs are in urban areas and 78% are rural. Selection of the clusters for this survey took into consideration that variation. The average size of an EA, measured in number of households, is 95 in an urban EA and 77 in a rural EA, with an overall average of 79

5.6 *Households Selection Process*

With support from Local Council leaders/ focal personals, the survey team started off by mapping the entire EA. This was followed by generation of the household list. Simple random sampling was then then be applied in order to randomly identify the 15 household for required for the survey.

5.7 *Data collection methods*

Quantitative data was collected using tools agreed upon by the consultant and resilience experts. However sample tools from UBOS with validated indicators were consulted. Face to face interviews last approximately 30 to 45 minutes were conducted after obtaining verbal consent. Key thematic areas of the quantitative data at the individual and household level include socio-demographic characteristics of the household, household assets, and all the resilience dimensions namely: wealth, health, agriculture, governance, human capital, infrastructure, natural resources and psycho-social well-being. A detailed English questionnaire with all sections is appended and the consent forms in the 4 main languages.

5.8 *Hiring and training of research assistants*

An internal advertisement was placed at MakSPH, Makerere University Institute of social Research (MISR) and College of Health Sciences) notice boards. All shortlisted candidates were subjected to an oral interview in order to ascertain further their capacities in research namely; interpersonal, communication, organizational and interviewing skills. Gender balance and being fluent in the local language were also considered.

Before the actual survey, the entire research team (supervisors, field editors, interviewers, data entrants and data supervisor) participated in a training that was conducted by the consultant, UBOS and RAN staff. The training consisted of classroom lectures, mock interviews, and practical interviews during the pilot testing phase. Study goal and ethical conduct of research sessions were also covered. The training program included further a detailed description of the content of the questionnaire, how to complete the questionnaire, interviewing techniques, informed consent process, data transport plus secure storage and other relevant information.

The field team composition for all the study districts constituted the following categories namely; a coordinator, a supervisor, interviewers (males and females) and a field guide (recruited in the community).

5.9 Translation of study tools

Translation and back translation of study tools was conducted with the assistance of two independent people for each language. The two people later met to discuss both versions and resolve discrepancies. A third person then back-translated a synchronized tool from local language into English.

5.10 Pre-testing, pilot test and pre-visit

A survey tool was pretested in one selected site which was not part of the assessment in order to ensure that they capture the intended information. A pilot was included within the training program. Following the pilot-testing, a discussion was organized with all data collectors to receive and document feedback. A feedback from the pilot test was therefore used to modify and finalize the survey tools.

The study team together with the district supervisor visited each district prior to the survey in order to sensitize the district/ and selected EAs and also to seek permission from local authorities. A district focal person was also be identified during this visit. The team spent at least 2 days in each district during this pre-visit exercise.

5.11 Study variables

A number of variables were collected under each dimension. The final dimension scale scales were further derived on both continuous and categorical scale. The outcome dimension scales from the two theoretical models were wealth, health and psychosocial wellbeing.

5.12 Data management and analysis

Completed forms were immediately handed over to the field data editor for review and editing to check for completeness and consistency. The field editor sat with the interviewers to discuss the likely errors and rectify them before the close of the day's work. After completing the editorial process, all the completed forms will be handed over to the supervisor for further editing and storage. The supervisor also edited randomly close to 10% of the completed forms for completeness. After field work, all completed and blank questionnaires were transported to RAN offices for additional data management process.

Before entry, all filled questionnaires were reviewed again in the office, as another layer of quality control. The office review was conducted manually by the data entrants to ensure consistency and completeness. Double data entry was done in CsPro (Census and Survey Processing System) version 5.0 by independent data entrants to ensure an error free dataset. The data management supervisor at the center was responsible for the overall data processing activities, which included among others, distribution of questionnaires, merging data files a daily backup of all the data captured for a day. All the hardcopies of the completed data collection tools were secured under lock and key, and were only be accessed by key data management team members alone.

Merged clean data files were then exported to STATA version 13.0 software for further cleaning and analysis. Major analytical tools included descriptive statistics in order to generate the baseline indicators. Descriptive statistics were generated for the variables within each dimension. Exploratory analysis was conducted and key relevant variables per dimension were discussed and agreed upon by the survey team basing on the theoretical framework and actual data. The teams also reviewed the data codes and took a decision on the direction of all variables in each dimension scale. Through a consultative effort, some variables were reversed in order to have a common flow for all of them in the same direction. Variables were further coded as binary or

ordinal before the data reduction process. A higher value code represented a positive contribution to that particular dimension scale. After this data management procedures, Principle Component Analysis (PCA) a data reduction technic was then applied stepwise in order to obtain the most reliable combination per variables for all the 8 dimension scale namely, wealth, health, psychosocial wellbeing, governance, infrastructure, social network and human capital. A higher score for a scale represents a positive response for that specific scale. Each scale was handled independently and a final list of variables that were included in the final dimension scale and their corresponding reliability scores (Cronbach's alpha) were generated. For this analysis, we have used only the first component. However, the rotated and unrelated components factors by scale were also generated and samples indicated in the Appendices. Households dimension scales were further ranked into 3 to 5 categories ranging from the lowest to the highest. For both human capital and social networks, a proxy variable was used because the variables and the data could not explain them well. Highest level of education was used for human capital dimension and sources of support in case of shock represented the social network dimension scale in this analysis. Such variables were therefore standardized and become continuous.

Since all the all dimension scale were measured on a continuous scale, linear regression models were therefore fitted based on the outputs dimension scales generated from the community consultations and qualitative research. Structural Equation Models (SEM) were also fitted to further explain all the pathways in the theoretical models. Results were presented in form of graphs and tables. Clear tables indicating variables per dimension scale were generated. Further, qualitative results were linked to the quantitative findings by linking the findings to the main themes.

5.13 Ethical considerations

Ethical approval was sought from Makerere University School of Public Health Higher Degrees Research and Ethics Committee HDREC (a local IRB) as well as the Uganda National Council for science and Technology (UNCST). Permission to conduct the survey was also obtained from the different administrative sections namely; district, sub-county village and even at household level. This was followed by verbal consent from each of the study participant. All possible measures were taken to protect confidentiality, observe informed consent, and to reduce any potential adverse consequence to the participants. Confidentiality was explained, and permission

gathered from all the interviewees. All client interviews were conducted in a private space to guarantee confidentiality. Consent forms, which adhere to the standard guidelines, were developed, translated and revised for local understanding.

6.0 Quantitative Survey findings

Out of 2020 planned sample, we were able to reach 2111 households making an overall response rate of 96%. Bududa district registered the lowest response rate of 84% as indicated in Table 3 below.

Table 3: Response rates by district

District	Planned sample	Actual sample	Response rate
AMURIA	544	540	99.3
BUDUDA	544	455	83.6
HOIMA	770	773	100.4
LAMWO	253	252	99.6
Overall	2111	2020	95.7

6.1 Respondents' socio-demographic characteristics

As indicated in Table 4 below, majority of the respondents were male (51%), by district, Amuria district registered slightly a high numbers of female respondents (53%) compared to others. Almost half of the respondents were aged between 25 and 44 years. The overall median age was 38 years (IQR±18) and Hoima district reported the lowest median age of 35 (IQR±20). According to marital status, more than a third of the respondents (78%) were in union. In relation to education, 16% of the respondents reported had no formal education. By district from Amuria (26%) had the highest proportion of respondents with no formal education followed by Lamwo (16%) and Hoima had the least of 10%. Christianity namely Catholics (43%), Anglican (36%) and Pentecostal (13%) is the dominant sect in all the four districts. Over 95% of the respondents were not in full-time employment and majority were engaged in subsistence agricultural related work. Close to 6 out of ten respondents were household heads.

Table 4: Socio-demographic factors by district

Characteristics		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Gender	Male	46.7	53.2	53.2	49.6	51.0
	Female	53.3	46.8	46.8	50.4	49.0
Age groups	18-24	12.6	13.2	16.6	11.9	14.2
	25-34	22.0	22.6	32.2	28.6	26.9

	35-44	25.9	23.1	21.0	21.4	22.8
	45-54	19.3	19.6	16.2	18.7	18.1
	55-64	9.1	9.9	8.2	6.8	8.6
	65+	9.6	11.2	5.4	11.9	8.7
	N/S	1.5	0.4	0.5	0.8	0.8
Marital status	Married	72.6	81.3	78.8	77.8	77.6
	Never Married	6.1	4.8	10.4	5.2	7.3
	Widowed	16.1	10.1	5.4	13.9	10.4
	Divorced	4.8	3.5	5.2	2.8	4.4
	Others	0.4	0.2	0.3	0.4	0.3
Education	None	25.7	14.7	9.8	15.9	15.9
	Primary	54.4	62.9	55.2	51.6	56.3
	O-level	15.4	16.0	26.9	18.7	20.4
	A-Level	0.9	1.1	3.5	5.2	2.5
	Tertiary	2.6	5.1	4.5	7.5	4.5
	Others	0.9	0.2	0.0	1.2	0.5
Relationship with HH head	Head	61.7	58.7	56.0	60.7	58.7
	Spouse	30.7	37.1	35.5	34.5	34.5
	Other relative	7.4	4.2	7.8	4.8	6.5
	Hired worker	0.2	0.0	0.8	0.0	0.4
Religion	Anglican	36.5	51.2	31.7	23.0	36.3
	Catholic	46.3	23.7	43.2	70.2	43.0
	Moslem	0.9	5.1	6.5	0.0	3.9
	Pentecostal	15.4	16.7	10.4	6.8	12.7
	Other	0.9	3.3	8.3	0.0	4.2
Current Employment	Employed full time	3.0	4.4	5.8	4.0	4.5
	Unemployed	2.4	3.5	9.8	13.5	6.9
	Housewife	3.3	2.6	5.4	9.5	4.8
	Casual labour (non-	0.9	1.3	4.0	1.2	2.2

	agriculture.)					
	Casual labour (Agriculture., fishery)	27.8	33.4	56.8	65.9	44.9
	Business	2.4	7.0	14.0	1.6	7.8
	Agriculture/Farmer/ Animal rearing	56.7	42.4	0.7	0.0	25.0
	Other	3.5	5.3	3.5	4.4	4.0
Settings	Rural	58.3	79.8	50.1	79.4	62.6
	Urban	41.7	20.2	49.9	20.6	37.4
	TOTAL	540	455	773	252	2020

6.2 Stressors and shocks

Table 5 below lists out the sets of stressors and shocks district had experienced before. The commonest included, drought (74%), low prices (60%), crop pests (56%) and bad roads (55%). By district, Amuria reported drought (96%), crop pests (67%), bad roads (62%) and low prices (57%); for Bududa, it was bad roads (68%), low prices (58%), landslides (55%) and crop pests (45%); Hoima had drought (72%), low prices (64%), bad roads (53%) and crop pests (51%) while Lamwo experiences mostly drought (85%), crop pests (66%), low prices (57%) and conflict (50%). Fire seems to be a challenge mostly in Lamwo district (22%) and almost not existing in Bududa (2%). Close to a quarter of the respondents (23%) in Hoima reported unemployment as a stressor.

Table 5: Reported stressors and shocks by district

		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
		540	455	773	252	2020
Drought	Yes	95.9	44.8	71.9	84.5	73.8
	No	3.9	54.7	27.7	15.1	25.8
	N/S	0.2	0.4	0.4	0.4	0.4
Floods	Yes	41.9	26.4	4.8	38.9	23.8
	No	57.4	68.6	94.8	59.5	74.5
	N/S	0.7	5.1	0.4	1.6	1.7
Landslides	Yes	26.1	55.2	8.9	31.4	26.7

	No	73.3	42.4	90.7	67.1	72.2
	N/S	0.6	2.4	0.4	1.6	1.0
Crop Pests	Yes	67.0	45.1	50.8	66.3	55.8
	No	33.0	54.1	49.0	33.3	43.9
	N/S	0.0	0.9	0.1	0.4	0.3
Livestock disease	Yes	45.9	31.2	33.9	45.2	37.9
	No	53.2	67.5	65.6	52.4	61.0
	N/S	0.9	1.3	0.5	2.4	1.0
High cost of inputs	Yes	43.2	41.8	27.2	40.5	36.4
	No	56.3	56.0	71.5	57.9	62.3
	N/S	0.6	2.2	1.3	1.6	1.3
Low prices	Yes	56.7	57.8	63.5	56.8	59.6
	No	43.0	39.8	36.2	42.1	39.6
	N/S	0.4	2.4	0.3	1.2	0.9
Experienced fire	Yes	8.9	2.0	9.4	21.8	9.2
	No	90.6	95.2	90.2	75.8	89.6
	N/S	0.6	2.9	0.4	2.4	1.2
Loss of employment	Yes	3.2	6.8	5.2	4.8	5.0
	No	95.9	85.3	93.9	92.9	92.4
	N/S	0.9	7.9	0.9	2.4	2.7
Bad Roads	Yes	61.9	67.9	52.7	23.8	55.0
	No	37.8	29.9	47.2	73.8	44.1
	N/S	0.4	2.2	0.1	2.4	0.9
Unemployment	Yes	10.9	15.2	22.5	7.5	15.9
	No	85.6	76.7	76.8	89.7	80.7
	N/S	3.5	8.1	0.7	2.8	3.4
Crime/substance abuse	Yes	15.9	15.0	13.5	20.2	15.3
	No	82.8	81.3	85.6	77.0	82.8
	N/S	1.3	3.7	0.9	2.8	1.9

Conflict	Yes	27.6	21.1	24.8	50.0	27.9
	No	71.1	75.8	74.8	48.8	70.8
	N/S	1.3	3.1	0.4	1.2	1.3
Lightening & Thunder	Yes	36.1	13.9	12.3	7.9	18.5
	No	62.0	82.9	86.8	88.1	79.5
	N/S	1.9	3.3	0.9	4.0	2.1

6.3 Individual dimension scales

A set of eight resilience dimension scales were constructed following the Ugandan theoretical frameworks however, the social capital/network and human capital were only explained by a single variable namely, sources of support in case of disaster and respondent's highest level of education respectively. Table 6 below presents variance per dimension scale that is the explained by the first PCA and Cronbach's alpha values for the final set of variables. A set of variables for psychosocial wellbeing dimension generated highest alpha values of 0.808, followed by agriculture and the infrastructure registered the least reliability score of 0.542. Apart from governance dimension, the first PCA component for the rest of the dimensions was able to explain between 26% and 37% of the variations in the data.

Table 6: PCA variability & reliability estimates

Dimension Scale	Variance (%)	Reliability Score (Cronbach's alpha)
Wealth	26	0.692
Psychosocial wellbeing	37.2	0.808
Agriculture	30.1	0.57
Health	33.7	0.761
Governance	50.4	0.622
Infrastructure	36.0	0.542

6.4 Wealth/ Social Economic Status (SES) dimension Scale

To generate the wealth scale of the households, a list of household wealth indicators listed in the in table 7 below were used. According to households' assets, more than 8 out of 10 households had mattresses, 73% mobile phones, 60% radios, 53% with improved roofs and generators were found in only 1.7%. Cars/Motor bikes are almost none existing in Bududa. More than half of the households (67%) reported access to loans but ownership of personal business was as low as 30%.

Table 7: Distribution of SES variables by district

Assets/Indicators		Variable type	AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Household Assets	Mobile phone	Yes/No	62.8	70.3	86.0	56.4	72.6
	Generator**	Yes/No	0.4	1.8	2.5	2.4	1.7
	Radio	Yes/No	41.3	68.6	76.1	35.3	60.0
	Mattress	Yes/No	74.8	94.5	93.7	65.5	85.3
	Solar panel**	Yes/No	10.2	9.9	25.2	18.7	16.9
	Bicycle/ Wheel barrow	Yes/No	56.9	11.9	34.0	44.8	36.5
	Electricity**	Yes/No	3.2	16.9	37.4	7.2	19.9
	Car or Motorbike**	Yes/No	5.0	1.5	18.5	4.8	9.4
	Improved stove**	Yes/No	0.8	10.4	2.3	0.4	3.5
House material	Improved roof	Yes/No	6.9	89.6	77.0	10.9	52.9
	Improved floor	Yes/No	5.8	9.1	30.1	8.3	16.1
	Improved wall**	Yes/No	96.9	8.2	49.6	72.2	55.8
	Improved toilet	Yes/No	52.0	74.8	81.2	70.6	70.6
Economic activities	Salaried household	Yes/No	9.3	8.8	17.6	11.1	12.6
	Own business	Yes/No	24.4	32.8	36.2	19.1	30.2
	Loan access	Yes/No	60.4	64.2	74.4	66.7	67.4
TOTAL			540	455	773	252	2020

** Indicators not included in the final SES scale: $\alpha = 0.6923$

Table 8 below clear indicates a statistically important relationship between all the demographic factor and wealth scale. According to the district, Hoima has the largest number of households (39%) households with high wealth scale and Amuria (4%) the least. Respondents aged under 35 had the least number of households (16%) in the first quintile but also the highest proportion (24%) in the highest wealth scale

category. In terms of location, the proportion of households from lowest to highest wealth scale reduces from 24% to 11%, while that of urban increased from 14% to 35% respectively.

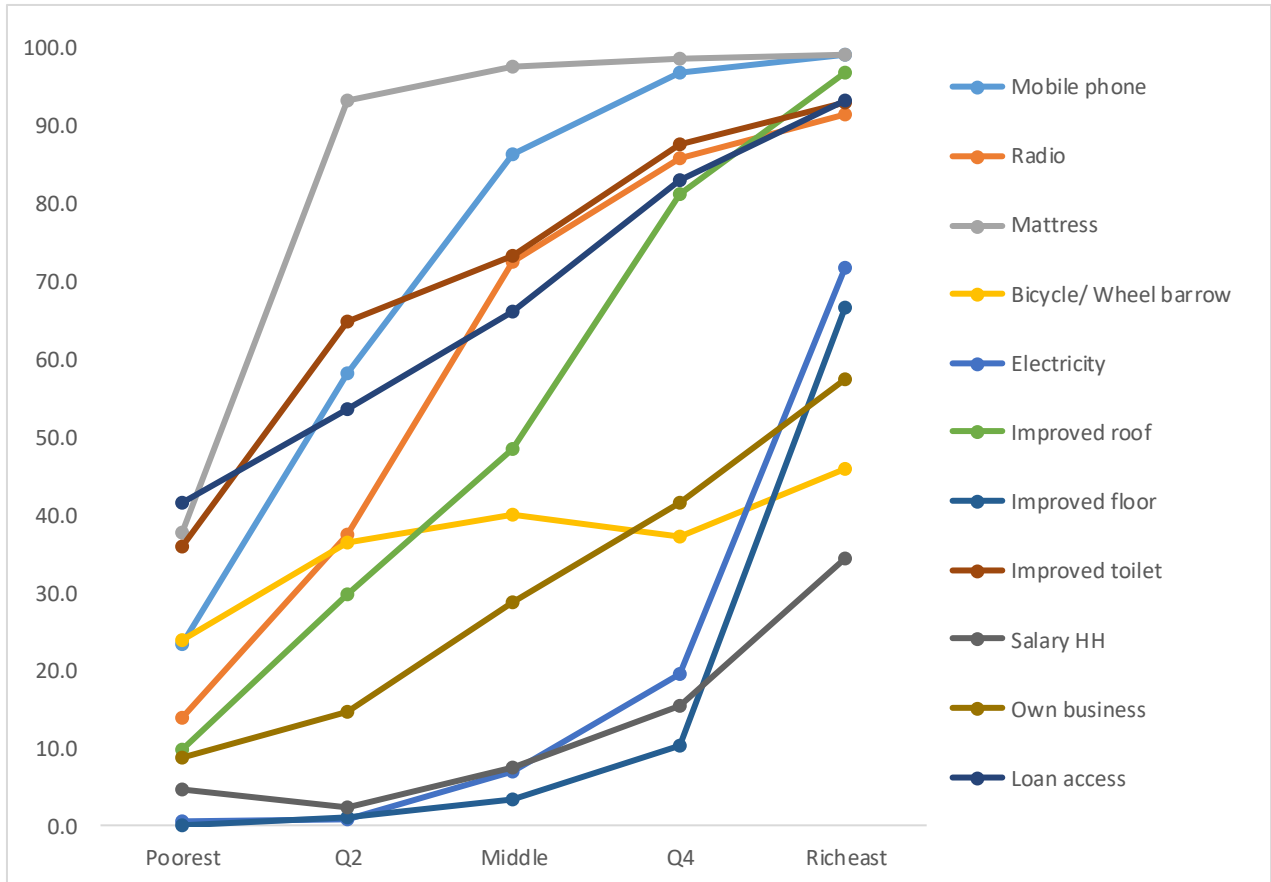
Table 8: Wealth scale by different characteristic

		N	First lowest	Second lowest	3rd lowest	4th lowest	Highest	Chi-square
District	AMURIA	535	38.1	29.4	21.1	7.5	3.9	625.97 (p<0.0001)
	BUDUDA	447	7.8	20.4	26.9	30.7	14.3	
	HOIMA	769	7.4	12.5	17.6	23.9	38.6	
	LAMWO	246	42.7	24.8	14.6	11.8	6.1	
Gender	Male	1,018	17.8	22.9	23.0	19.4	17.0	28.96 (p<0.0001)
	Female	979	22.5	17.6	17.4	19.7	22.9	
Marital status	In Union	1,550	16.5	19.9	22.1	21.3	20.1	67.76 (p<0.0001)
	Not in Union	447	32.4	21.5	13.7	13.42	19.0	
Age groups	18-35	887	16.2	18.7	21.9	19.5	23.7	47.30 (p<0.0001)
	36-50	654	19.3	19.7	19.9	22.02	19.1	
	51 plus	440	28.2	23.7	18.0	16.59	13.4	
Settings	Rural	1,247	23.6	23.7	22.8	19.3	10.8	
	Urban	750	14.3	14.8	16.0	20.0	35.1	

Variance=25.9%: N=1997

As indicated Figure 3 below, in these communities, there are households that do not have mattresses, improved toilets, mobile phones and even access to loan services

Figure 3: Percentage of households with indicators by final wealth scale (quintile)



Various PCA factors also indicate clustering of some variables. The data clearly show a clear pattern with the presence of assets like mobile phones, radio and mattress as likely measures of wealth in a household. The rest of the household assets used in study do not directly form clusters under this wealth dimension scale.

6.5 Psychosocial dimension

Tables 9a and 9b describe the households' psychosocial ratings in each of the four study districts. Overall, less than half (40%), were at least feeling good, 37% were dissatisfied with life, only 14% felt able to control important things in life, 25% were never confident about handling personal problems and close to half (47%) felt as if difficulties were continuous piling up. Fourteen percent of the responded felt that life was not a source of satisfaction; almost half (42%) were defeated by stressors and only 23% always were positive about life going forward in those communities. Close to third (27%) had started feeling better off after recovering from the stressors.

Table 9a: Psychosocial indicator by district

Characteristics		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Current health rating	Poor	28.3	20.9	24.6	26.6	25.0
	Average	42.0	43.1	29.0	23.4	35.0
	Good	13.2	30.3	32.6	36.1	27.3
	Very Good	14.3	3.3	8.7	9.1	9.0
	Excellent	1.7	2.0	4.9	4.8	3.4
	N/S	0.6	0.4	0.3	0.0	0.4
How satisfied are you with your life as a whole	Very dissatisfied	8.3	6.4	4.9	2.4	5.8
	Dissatisfied	37.0	24.8	30.0	31.4	30.9
	Neutral	20.7	28.6	21.0	18.3	22.3
	Satisfied	27.4	34.7	39.6	40.9	35.4
	Very satisfied	5.9	5.3	4.3	6.4	5.2
	N/S	0.6	0.2	0.3	0.8	0.4
Felt unable to control the important things in life	very often	11.9	12.3	8.4	9.5	10.4
	Fairly often	31.5	20.9	23.7	22.2	25.0
	Sometimes	44.4	42.9	34.8	35.7	39.3
	Almost never	9.6	14.7	24.2	21.8	17.9
	Never	2.0	9.0	8.9	10.7	7.3
	N/S	0.6	0.2	0.0	0.0	0.2
Confidence about handling personal problems	Never	6.1	4.6	7.1	13.5	7.1
	Almost Never	19.1	16.5	17.5	17.5	17.7
	Sometime	45.2	44.8	36.7	35.7	40.7
	Fairly	24.3	25.7	29.5	27.4	27.0
	Very often	5.0	8.4	8.9	6.0	7.4
	N/S	0.4	0.0	0.3	0.0	0.2
Felt things were going your way	Never	7.8	6.2	8.7	17.5	9.0

	Almost never	23.3	18.7	20.7	23.8	21.3
	sometimes	45.4	44.0	36.2	32.5	40.0
	Fairly often	18.9	24.0	25.9	23.4	23.3
	Very often	4.4	7.3	8.4	2.4	6.3
	N/S	0.2	0.0	0.1	0.4	0.2
Felt difficulties were piling up so high	Always	18.7	14.7	11.3	21.0	15.3
	Most times	38.2	29.0	26.9	38.9	31.9
	Sometimes	34.8	34.7	31.7	19.8	31.7
	Almost never	7.4	14.5	22.9	16.7	16.1
	Never	0.7	6.8	7.0	3.6	4.9
Usually see solution to problems and difficulties	N/S	0.2	0.2	0.3	0.0	0.2
	Never	8.2	7.5	15.5	11.5	11.2
	Almost never	18.3	15.6	14.5	17.5	16.1
	Sometimes	48.5	45.3	38.4	30.6	41.7
	Most times	20.0	26.2	24.8	32.1	24.8
	Always	4.8	5.1	6.3	8.3	5.9
	N/S	0.2	0.4	0.4	0.0	0.3
	TOTAL	540	455	773	252	2020

Table 9b: Psychosocial indicator by district

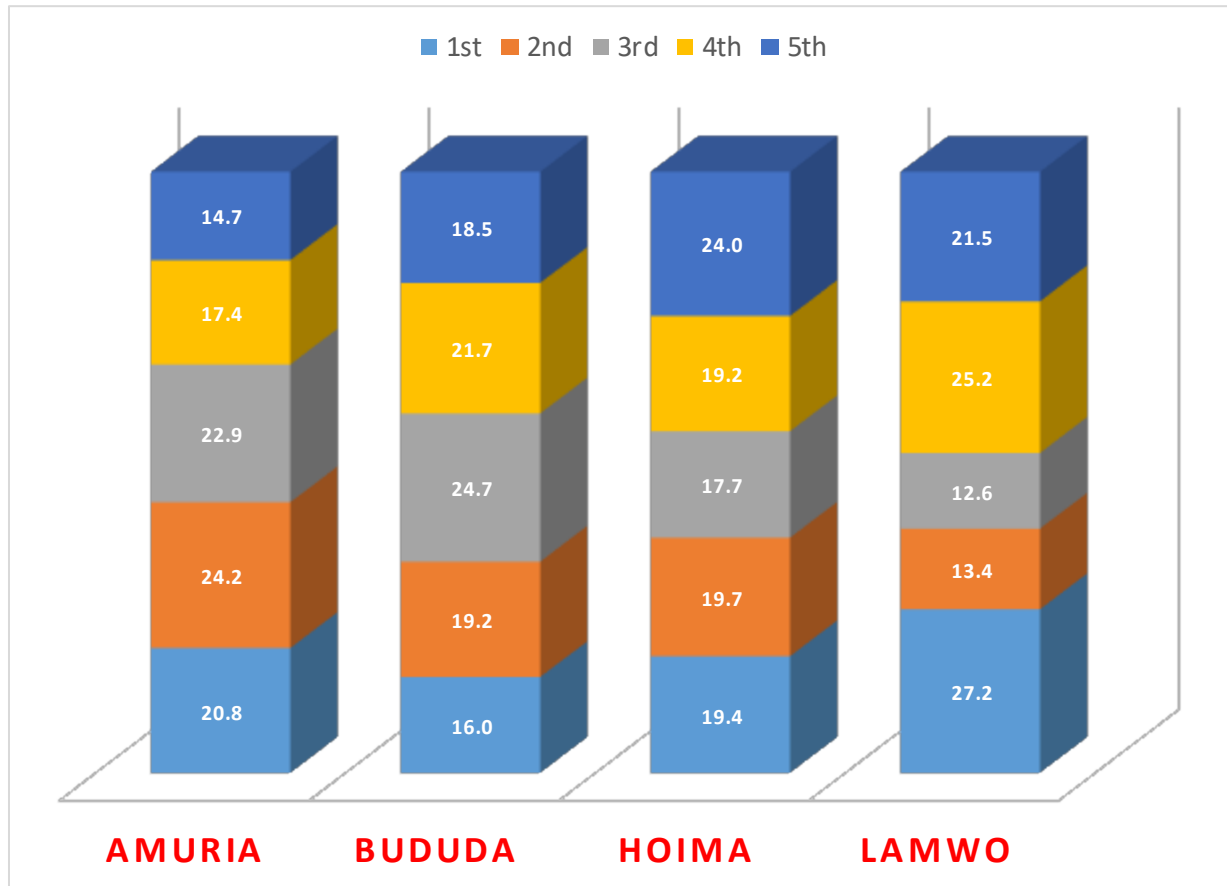
Characteristics		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Feel life is a source of personal satisfaction	never	9.3	2.9	7.8	14.7	7.9
	Almost never	23.9	18.0	13.1	11.9	16.9
	Sometimes	42.6	42.4	37.9	31.4	39.4
	Most times	18.5	25.9	28.9	30.2	25.6
	Always	4.4	10.6	12.3	11.1	9.7
	N/S	1.3	0.2	0.1	0.8	0.5
Feel defeated by the stressors	Always	17.6	9.0	10.6	2.4	11.1
	Most times	33.7	18.2	30.7	44.1	30.4
	Sometimes	33.0	35.0	32.2	30.2	32.8
	Always never	10.4	20.2	17.6	17.5	16.2
	Never	5.0	17.1	8.5	5.6	9.2
	N/S	0.4	0.4	0.4	0.4	0.4
Extent of recovery from stressors	Not recovered	25.6	7.0	30.8	9.5	21.4
	Recovered but worse off	29.3	20.0	10.4	25.4	19.5
	recovered to pre-level	31.7	22.6	16.4	19.1	22.2
	Better off	12.0	40.4	24.3	44.8	27.2
	Not stressed at all	0.6	9.7	17.6	0.4	9.1
	N/S	0.9	0.2	0.5	0.8	0.6
Adapted to living with the main stressor	Not at all	17.0	3.3	9.8	2.4	9.4
	Struggle	29.3	14.7	20.2	15.9	20.8
	Adapted	37.8	33.2	23.0	60.7	34.0
	Mostly	11.3	26.4	17.0	14.3	17.2
	Definitely	3.5	20.4	29.4	6.4	17.6
	N/S	1.1	2.0	0.7	0.4	1.0

Positive about life going forward	Never	3.0	2.9	3.0	9.1	3.7
	Almost never	8.0	13.0	7.8	7.1	8.9
	Sometimes	33.2	27.5	24.5	29.0	28.0
	Most times	35.2	37.8	37.5	30.2	36.0
	Always	18.3	18.9	27.2	23.8	22.5
	N/S	2.4	0.0	0.1	0.8	0.8
Felt lonely	Always	12.6	8.8	8.4	10.3	9.9
	Most times	18.5	15.2	15.9	25.4	17.6
	sometimes	38.0	34.1	27.0	24.6	31.2
	Almost never	15.7	20.0	18.5	15.5	17.7
	Never	12.6	22.0	30.1	24.2	22.9
	N/S	2.6	0.0	0.0	0.0	0.7
	TOTAL	540	455	773	252	2,020

6.6 Psychosocial Scale

Out of the above 13 indicators, only 3 were not included in the final psychosocial scale. Those eliminated include; feeling life as a source of personal satisfaction, being positive about life going forward and feeling lonely. As indicated in Figure 4 below, Hoima district reported the highest percentage (24%) of households with a high psychosocial well-being scale, followed by Lamwo (22%), Bududa (19%) and Amuria the least (15%). It is clearly evident from the graph that Lamwo registered a highest proportion of households (27%), with low psychosocial well-being scale, followed by Amuria (21%) and finally Bududa (16%).

Figure 4: Proportion of households in psychosocial scale category by district



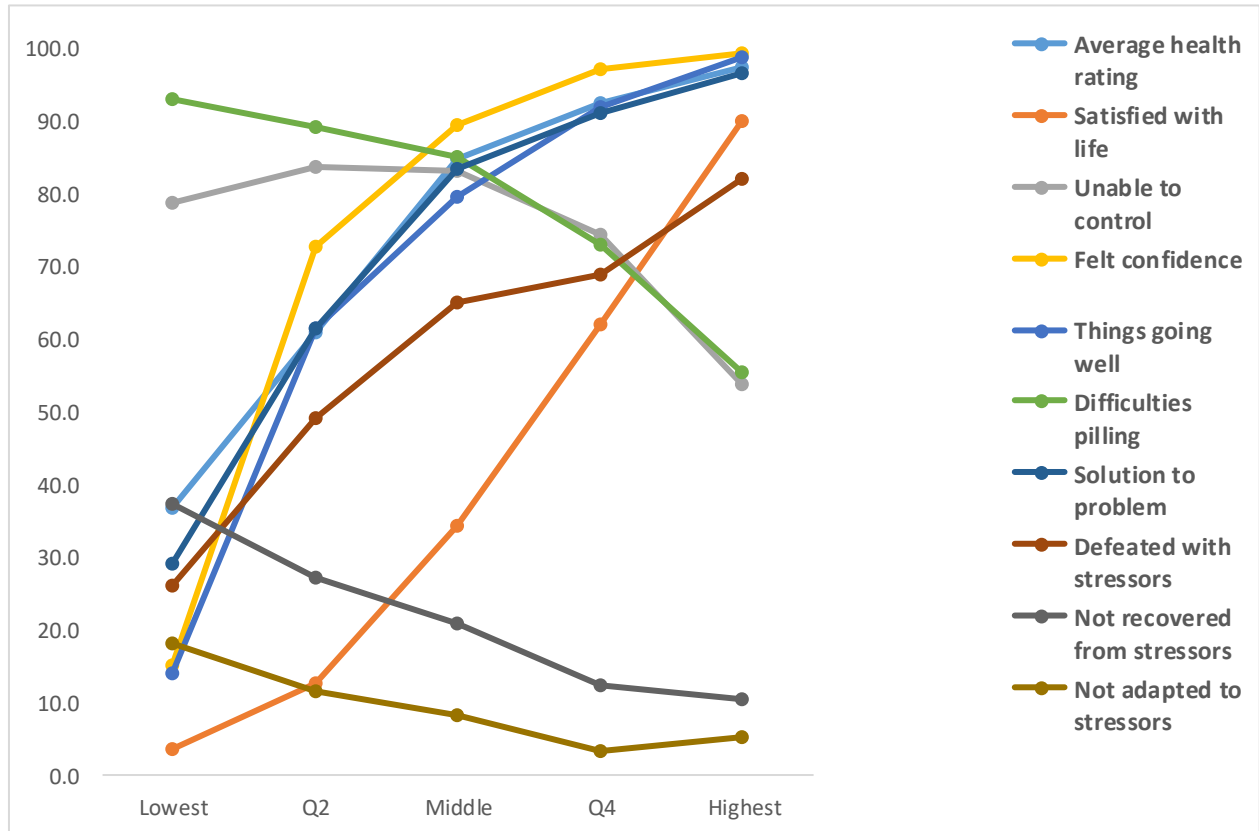
From bivariate analysis, Hoima (24%) has the largest number of households in the highest score category, followed by Lamwo (22%) and the least was Amuria (15%). There was a statistically significant relationships between psychosocial scale and selected demographic factors as indicated in table 10. Figure 5 clearly indicates that feels about problems pilling, inability to control important things in life and failure to recover from stressors decline with an increase in the psychosocial scale. Other aspects, such as feeling health, currently satisfied with life and able to identify solutions to pressing problems to improve with an increase the psychosocial well-being dimension scale. .

Table 10: Psychosocial scale by different characteristics

		N	First lowest	Second lowest	3rd lowest	4th lowest	Highest	Chi-square
District	AMURIA	524	20.8	24.24	22.9	17.37	14.69	56.25 (<0.0001)
	BUDUDA	438	15.98	19.18	24.66	21.69	18.49	
	HOIMA	751	19.44	19.71	17.71	19.17	23.97	
	LAMWO	246	27.24	13.41	12.6	25.2	21.54	
Gender	Male	997	16.55	19.06	20.86	20.86	22.67	22.01(<0.0001)
	Female	962	23.6	21	19.13	19.13	17.15	
Marital status	In Union	1,517	16.74	20.17	20.24	21.09	21.75	50.91 (<0.0001)
	Not in Union	442	31.22	19.46	19.23	16.29	13.8	
Age groups	18-35	859	12.7	17.4	21.2	23.5	25.3	134.63(<0.0001)
	36-50	646	18.7	20.9	20.4	20.3	19.7	
	51 plus	438	35.6	24.0	17.1	12.6	10.7	
Settings	Rural	1,228	21.5	21.0	19.7	20.0	17.8	12.89 (0.012)
	Urban	731	17.5	18.3	20.5	20.1	23.5	

Alpha= 0.8084

Figure 5: Percentage of households with indicators by final psychosocial scale (quintile)



Out of the 10 variables that were finally used to generate the psychosocial dimension scale, there some elements of clustering. There were some of the variables that formed clusters i) feeling health and currently satisfied with the whole life these days; ii) confidence to handle current problems and also those who felt that things were going in the right direction and iii) extent of defeat from stressors, level of recovery and being able to adopt.

6.7 Agriculture dimension scale

This dimension presence of livestock, poultry, growing gains, use of fertilizers and seeking advice from extension workers in the area as the main drivers for this scale. Food crops/ grains were almost grown by all the respondents (91%); but mostly in Amuria and Lamwo districts (Table 11). Receiving agricultural extension services was minimal (31%) in all the 4 districts, but the practice is more in Bududa than the rest. As indicated in table 12 and Figure 6, the practices of protecting stored food and getting services from extension workers declined with an increase in agricultural scale.

Table 11: Agriculture indicator by district

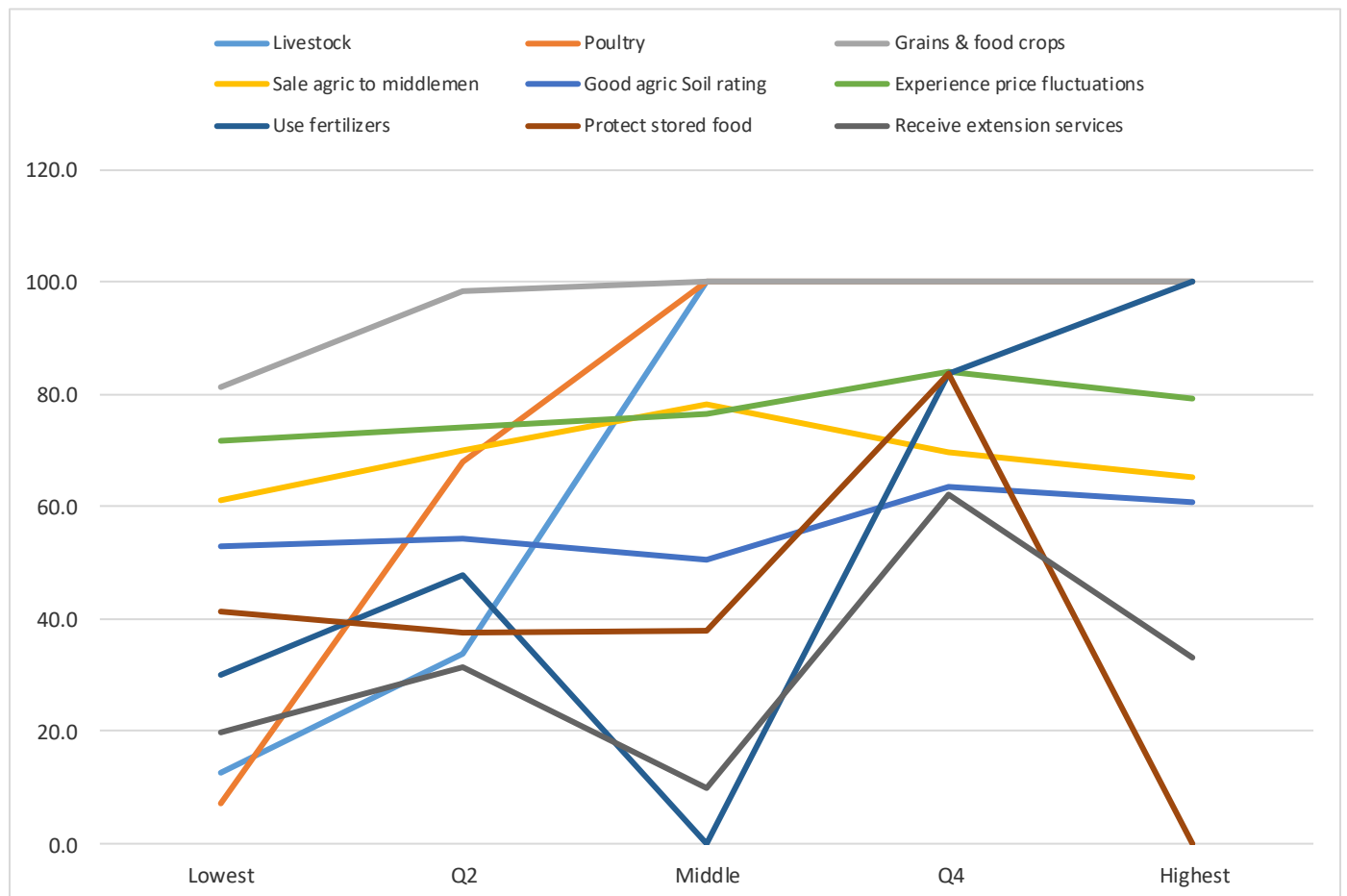
Agriculture		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Livestock	Yes/No	76.1	80.7	49.2	56.8	64.4
Poultry	Yes/No	81.9	85.5	57.1	62.7	70.8
Grains & food crops	Yes/No	95.4	97.4	83.2	95.2	91.1
Sale agriculture to middlemen**	Yes/No	79.6	53.6	67.4	67.9	67.6
Agriculture Soil rating**	Good/Not good	47.6	63.3	52.7	52.4	53.7
Experience price fluctuations**	Yes/No	73.5	78.2	77.0	68.3	75.3
Use fertilizers	Yes/No	31.5	83.5	36.0	27.8	44.5
Protects stored food	Yes/No	37.8	65.3	29.5	36.1	40.6
Receive extension services	Yes/No	20.4	44.6	28.3	38.1	31.1
	TOTAL	540	455	773	252	2,020

** Indicators not included in the final agriculture scale: $\alpha = 0.5701$

Table 12: Agriculture scale by different characteristics

		N	First lowest	2nd lowest	3rd lowest	4th lowest	Highest	Chi-square
District	AMURIA	468	13.89	17.31	38.25	15.6	14.96	393.78 (<0.0001)
	BUDUDA	444	8.33	17.12	6.08	48.87	19.59	
	HOIMA	590	29.83	26.44	16.78	14.92	12.03	
	LAMWO	212	36.32	15.09	17.92	21.7	8.96	
Gender	Male	903	17.28	18.94	20.71	27.24	15.84	20.21 (<0.0001)
	Female	811	24.54	21.45	19.24	21.95	12.82	
Marital status	In Union	1,342	17.73	19.15	20.34	27.27	15.5	
	Not in Union	372	31.45	23.66	18.82	15.59	10.48	
Age groups	18-35	752	23.27	21.28	18.35	24.07	13.03	21.18 (0.007)
	36-50	566	15.9	17.31	22.44	27.74	16.61	
	51 plus	381	22.05	21.78	19.69	22.05	14.44	
Settings	Rural	1104	19.93	19.84	20.74	26.72	12.77	12.6 (0.013)
	Urban	610	22.13	20.66	18.69	21.15	17.38	

Figure 6: Percentage of households with indicators by final agriculture scale (quintile)



For the variables that contributed to this agriculture dimension scale, there are mainly 2 clusters. The first set of clustering occurred among households that keep livestock, poultry and producing grains or food crops. The second set of clustering considered improved agriculture methods as measured by the three variables; offering protection for stored food, application of fertilizers and receiving agricultural extension services. Any of those sets is associated with a high agricultural scale.

6.8 Health dimension scale

The health scale was built basing on the sickness in the household, quality and access to services. More than 7 out of 10 households experienced at least a sick person in the past 30 days. Close to half of the respondent (47%) reported poor quality of health services in their areas, and this hinders access to service (58%). Health insurance coverage was almost none existing in all the households across the four districts.

About half of the respondents perceived good quality of services within their facilities. Seven out of 10 reported that facility opening hours are convenient in their areas. More than half (58%) felt that poor quality services in facilities discourage them from access. Almost all respondents felt that culture does not affect access to health services their respective communities. However, in Bududa, 1 out of 10 respondents feel that culture still affects access to health services.

Table 13: Health indicators by district

Health		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Had a sick person **	Yes/No	86.5	62.0	66.2	87.7	73.4
With 5 km to facility	Yes/No	78.2	77.6	77.8	85.3	78.8
With 45min	Yes/No	29.6	63.5	61.8	41.3	51.0
Perceived quality of care	Not poor/poor	55.9	44.6	53.4	58.7	52.8
Insurance access**	Yes/No	0.2	2.6	1.4	1.2	1.3
Source of water**	Improved/Not improved	89.6	69.5	63.8	77.8	73.7
Long distance affects access	Yes/No	69.1	57.6	52.7	49.2	57.7
Culture affects access**	Yes/No	1.3	9.9	2.2	0.4	3.5
Transport cause a problem to access	Yes/No	54.6	47.5	35.7	38.1	43.7
Range of service not a concern	Yes/No	57.0	46.6	37.3	34.9	44.4
Opening hours convenient	Yes/No	62.4	54.3	81.8	70.6	69.0
Poor quality of service does not hinder access	Yes/No	43.5	40.7	42.0	40.5	41.9
Long waiting time does not affect access	Yes/No	65.4	80.9	70.4	77.0	72.2
Medicine and supplies available	Yes/No	70.7	59.1	62.0	74.2	65.2

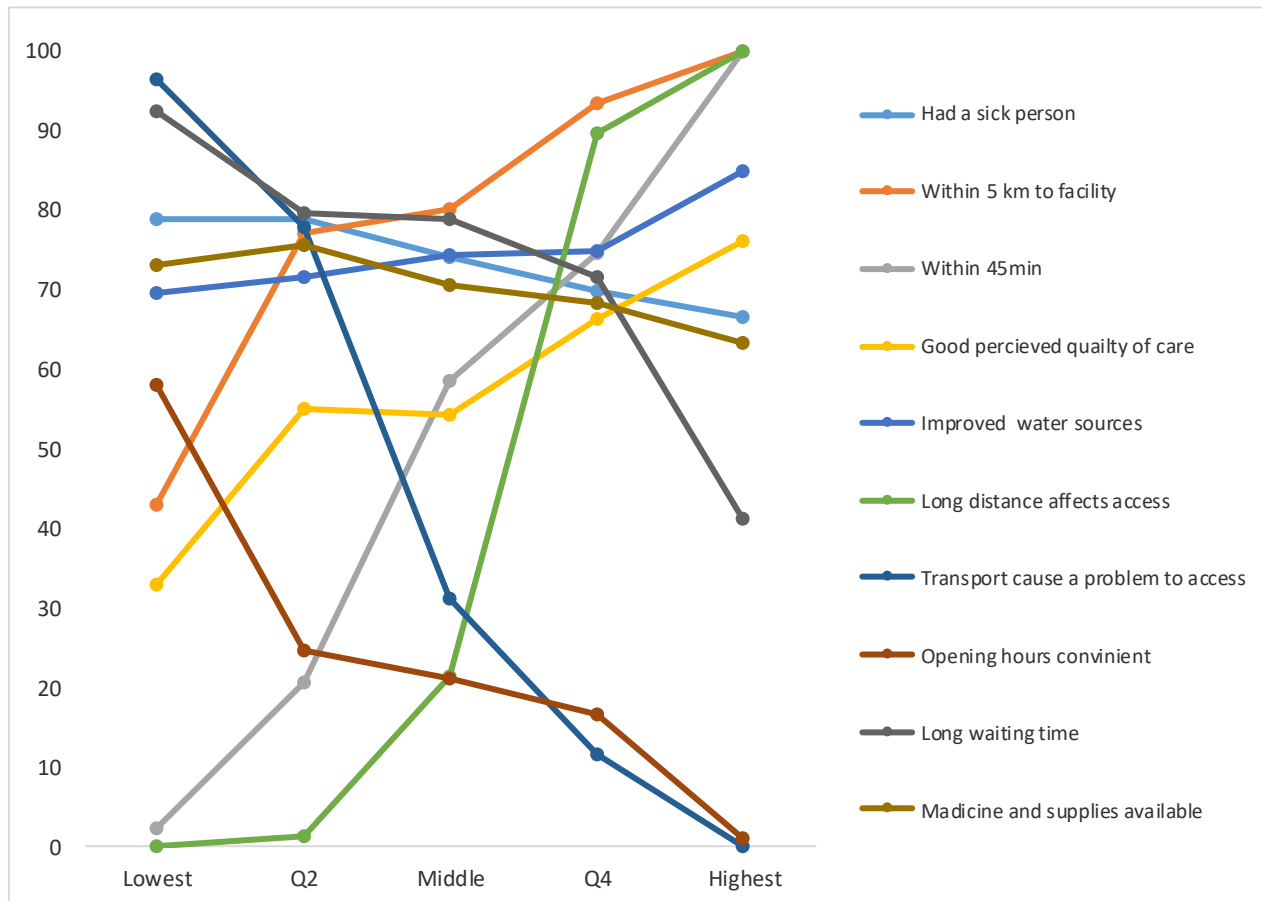
** Indicators not included in the final agriculture scale: *Alpha= 0.761*

Health score was not significantly related to respondents ages (p-value=0.123) and marital status (p-value= 0.704) and indicated in table 14. Opening hours and transport being a hindering factor for accessing health services were inversely proportion to the entire health scale. Long distance to facilities not being a hindrance to accessing health services and residing within 45 minutes walking distance to the facility were positively associated with a better health score (Figure 6).

Table 14: Health scale by different characteristics

		N	Lowest	Q2	Middle	Q4	Highest	Chi-square
District	AMURIA	475	31.2	19.8	15.0	20.2	13.9	105.02 (p<0.0001)
	BUDUDA	353	22.1	20.7	24.9	23.8	8.5	
	HOIMA	699	12.9	21.8	19.0	23.0	23.3	
	LAMWO	227	16.7	16.7	24.2	28.6	13.7	
Gender	Male	860	19.9	23.1	20.5	23.6	12.9	20.48 (P<0.0001)
	Female	894	20.5	17.7	19.1	22.7	20.0	
Marital status	In Union	1,344	19.8	20.9	20.2	22.8	16.4	2.17 (p=0.704)
	Not in Union	410	21.5	18.5	18.5	24.4	17.1	
Age groups	18-35	763	18.0	20.5	19.1	23.5	19.0	12.67 (p=0.123)
	36-50	573	19.4	20.1	21.5	23.9	15.2	
	51 plus	405	24.4	21.0	19.0	21.7	13.8	
Settings	Rural	1,121	24.7	21.7	21.9	21.1	10.6	112.16 (P<0.0001)
	Urban	633	12.2	18.0	16.1	26.7	27.0	

Figure 7: Percentage distribution of households by health scale (quintile)



Although variables used to compute the health dimension were mainly focusing on access, some clusters were identified within among these variables namely; i) living within a distance of 5km or spending up to 45 minutes to the facility; ii) long distance and means of transport both affect access and iii) long waiting time plus availability of medicines and supplies also do influence access of health services in these communities.

6.9 Governance dimension scale

Governance was measured using 6 indicators but only 4 were included in the scale based in alpha value of 0.622 where 50.4% of the variation in the data is explained (table 15). Less than half of the respondents (47%) felt that government does not include their priorities. This was more pronounced in Lamwo and Hoima districts. According to the data, more than half respondents (57%) feel that local governments do not care about them. Two thirds of the respondents had never paid for any free service in their community. The proportion of households that reported some corruption within the community and absence of land wrangles was close 80% in each of the three scale categories (Figure 7).

Table 15: Governance indicators by district

Characteristics		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Gov't decision includes my priority	Yes/No	53.5	50.8	40.6	42.5	46.6
Local governments care about us	Yes/No	53.7	46.6	36.0	34.5	42.9
Central gov't decision includes my priorities	Yes/No	55.4	62.2	35.8	43.3	47.9
Never paid in any form for a local free service	Yes/No	87.0	60.4	76.3	73.8	75.3
No corruption in community**	Yes/No	35.0	17.8	28.7	6.8	25.2
Land wrangles don't exist in this community**	Yes/No	30.7	28.6	33.4	13.1	29.1

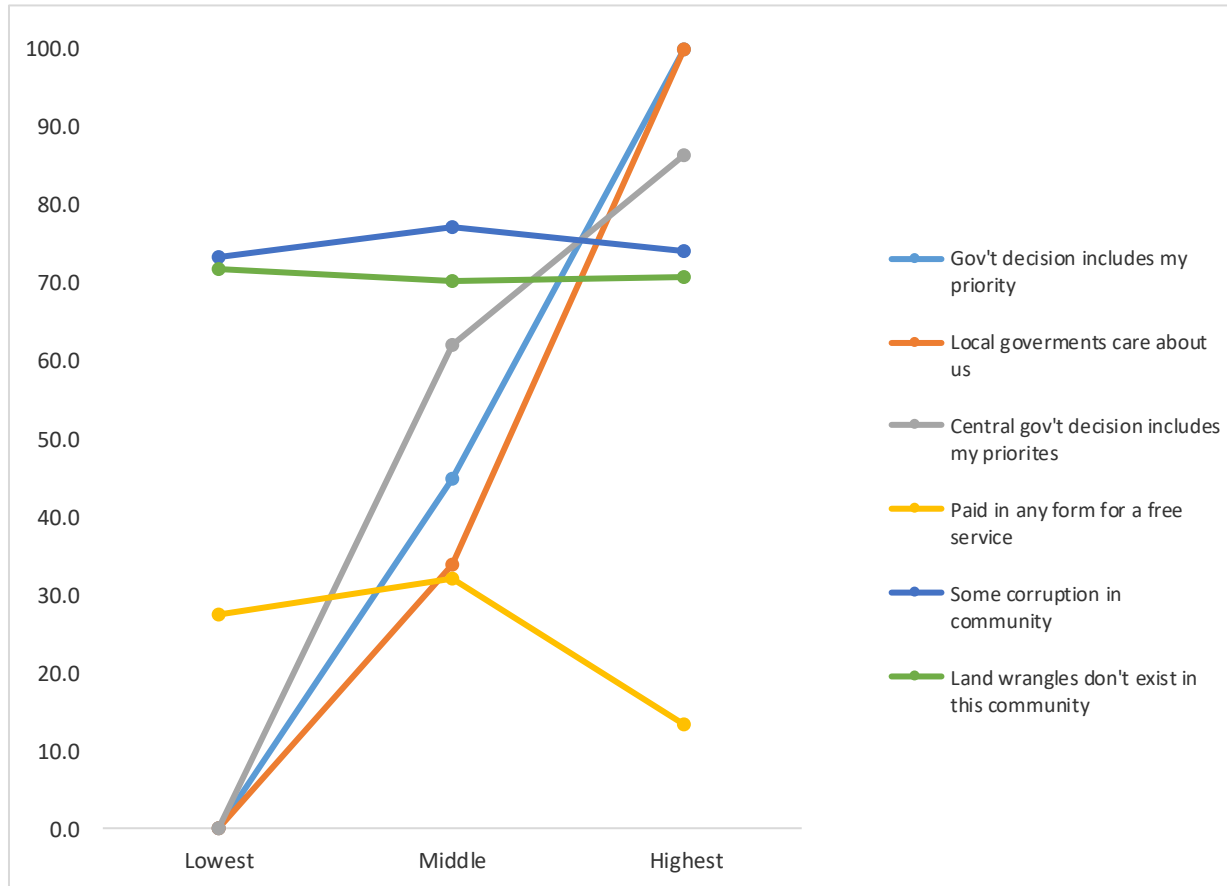
** Indicators not included in the final agriculture scale: *Alpha= 0.6221*

The score was categorized into three levels generated from the governance dimension scale clearly show statistically significant association with the socio-demographic variables except age as indicated in table 16. Majority of households in Hoima districts fall within the lowest score of the governance score. There is a high proportion of urban households in the lowest governance scale than rural.

Table 16: Governance scale by different characteristics

		N	Lowest	Middle	Highest	Chi-square
District	AMURIA	534	32.8	23.0	44.2	151.5 (0.000)
	BUDUDA	447	18.1	49.4	32.4	
	HOIMA	772	44.2	31.4	24.5	
	LAMWO	251	39.8	33.9	26.3	
Gender	Male	1,022	36.0	36.6	27.4	19.3 (0.000)
	Female	982	33.5	30.2	36.3	
Marital status	In Union	1,553	33.2	34.6	32.2	7.7246 (0.021)
	Not in Union	451	40.1	29.7	30.2	
Age groups	18-35	889	34.2	34.1	31.7	1.8391 (0.765)
	36-50	658	34.2	32.2	33.6	
	51 plus	441	36.3	33.6	30.2	
Settings	Rural	1,256	32.4	38.3	29.3	35.0416(0.000)
	Urban	748	38.8	25.4	35.8	

Figure 8: Percentage distribution of HH by governance scale (quintile)



6.10 Infrastructure dimension

Selected indicators used to estimate this scale included roads/bridges, distance to the main road and household construction materials as indicated in Tables 17 and 18. Slightly more than half of the respondents (56%) felt that bridges in their area are useable. Lamwo has the largest proportion of households (84%) supporting usable roads and Amuria the least (44%). About half of the households were reported to be within 1 km distance (52%) to the main road. Apart from floor materials, slightly half of the respondents reported improved construction for the roof (53%) and walls (56%). Households with worst floor construction materials were mostly in Amuria (94%) followed Lamwo (91%) districts.

Table 17: Infrastructure indicators by district

Characteristics		AMURIA	BUDUDA	HOIMA	LAMWO	ALL
Bridges/Roads	Poor	55.74	48.13	42.95	15.08	44.06
	Useable	43.7	51.65	56.92	84.13	55.59
	N/S	0.56	0.22	0.13	0.79	0.35
Rating of bridges/roads	Below Average	72.04	58.46	45.54	22.62	52.67
	Average	26.3	38.02	53.04	71.83	44.85
	N/S	1.67	3.52	1.42	5.56	2.48
Distance to main road	> 1km	48.89	61.98	43.47	27.78	47.13
	Within 1km	50.37	36.26	55.76	70.24	51.73
	N/S	0.74	1.76	0.78	1.98	1.14
Roof materials**	Not improved	93.15	10.33	23.03	87.3	46.93
	Improved	6.85	89.23	76.97	10.71	52.72
	N/S	0	0.44	0	1.98	0.35
Floor materials	Not improved	94.07	90.55	69.73	91.67	83.66
	Improved	5.74	9.01	30.01	8.33	16.09
	N/S	0.19	0.44	0.26	0	0.25
Wall materials	Not improved	3.15	91.43	50.45	27.78	44.21
	Improved	96.85	8.13	49.55	72.22	55.69
	N/S	0	0.44	0	0	0.1
		540	455	773	252	2020

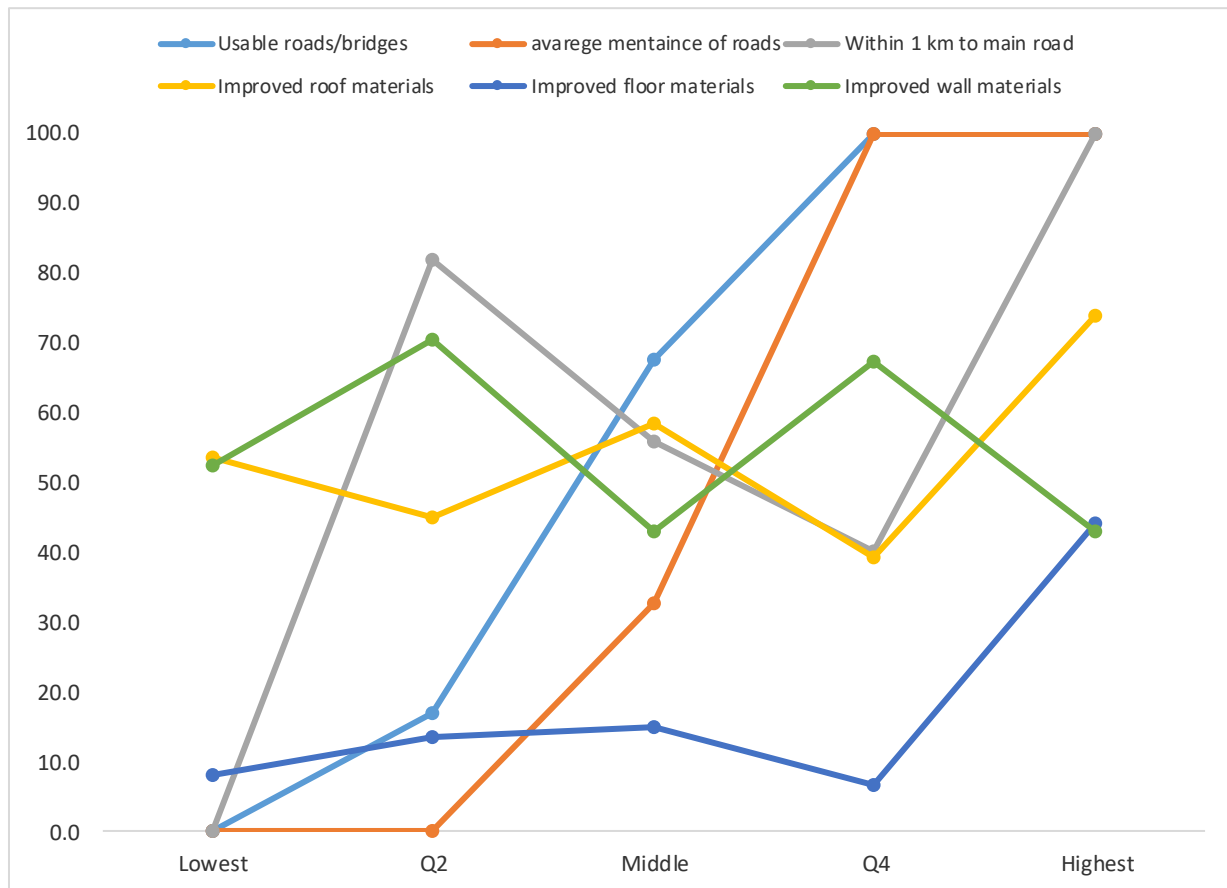
** Indicators not included in the final infrastructure scale: *Alpha= 0.5418*

Table 15 clearly shows a statistically important difference between infrastructure and districts (p-value< 0.0001). All the socio-demographic factors also represent a statistically significant relationship with this scale. As observed from Figure 9, the percentage of households with improved flow is low but improves as the scale increases. However, with a low of 0.54, interpretation of these finding should be done with caution.

Table 18: Infrastructure scale by different characteristics

	Items	N	Lowest	Q2	Middle	Q4	Highest	Chi-square
District	AMURIA	524	29.4	32.4	16.2	20.4	1.5	462.67 (p<0.0001)
	BUDUDA	431	26.2	12.5	31.3	16.7	13.2	
	HOIMA	753	21.9	17.0	13.9	17.3	29.9	
	LAMWO	233	1.3	14.6	8.6	55.8	19.7	
Gender	Male	990	23.8	21.4	19.5	20.4	14.9	19.02 (p=0.001)
	Female	951	20.9	18.3	16.0	24.9	19.9	
Marital status	In Union	1,507	22.6	21.2	17.1	22.8	16.5	0.501 (p=0.033)
	Not in Union	434	21.9	15.4	20.3	22.1	20.3	
Age groups	18-35	861	22.4	18.5	17.1	21.0	21.0	23.63 (p=0.003)
	36-50	635	21.3	23.0	18.7	21.9	15.1	
	51 plus	430	23.7	18.4	17.9	27.0	13.0	
Settings	Rural	1,213	24.2	17.3	19.1	25.5	13.9	52.96 (p<0.0001)
	Urban	728	19.4	24.2	15.5	17.9	23.1	

Figure 9: Percentage distribution of HH by Infrastructure scale (quintile)



There were only two clusters observed under the infrastructure scale. The first one included to variables; rating of the roads or bridges and their usability levels. The second focused on the remaining three distance to main road and household building materials (floor and wall)

6.11 Social Capital dimension

For this dimension, only one variable was used to come-up with the socio-capital scale. This was related to where members run first in case of an event or disaster. There were classified as family, neighbor or others. Running to the neighbors (31%) was prominent factors in all the districts as indicated in figure 10 below. Two out of 10 individuals usually go to families for support during disasters, the rest go institutions like police, churches or NGOs in the area.

Figure 10: Source of socio-support in case of a disaster

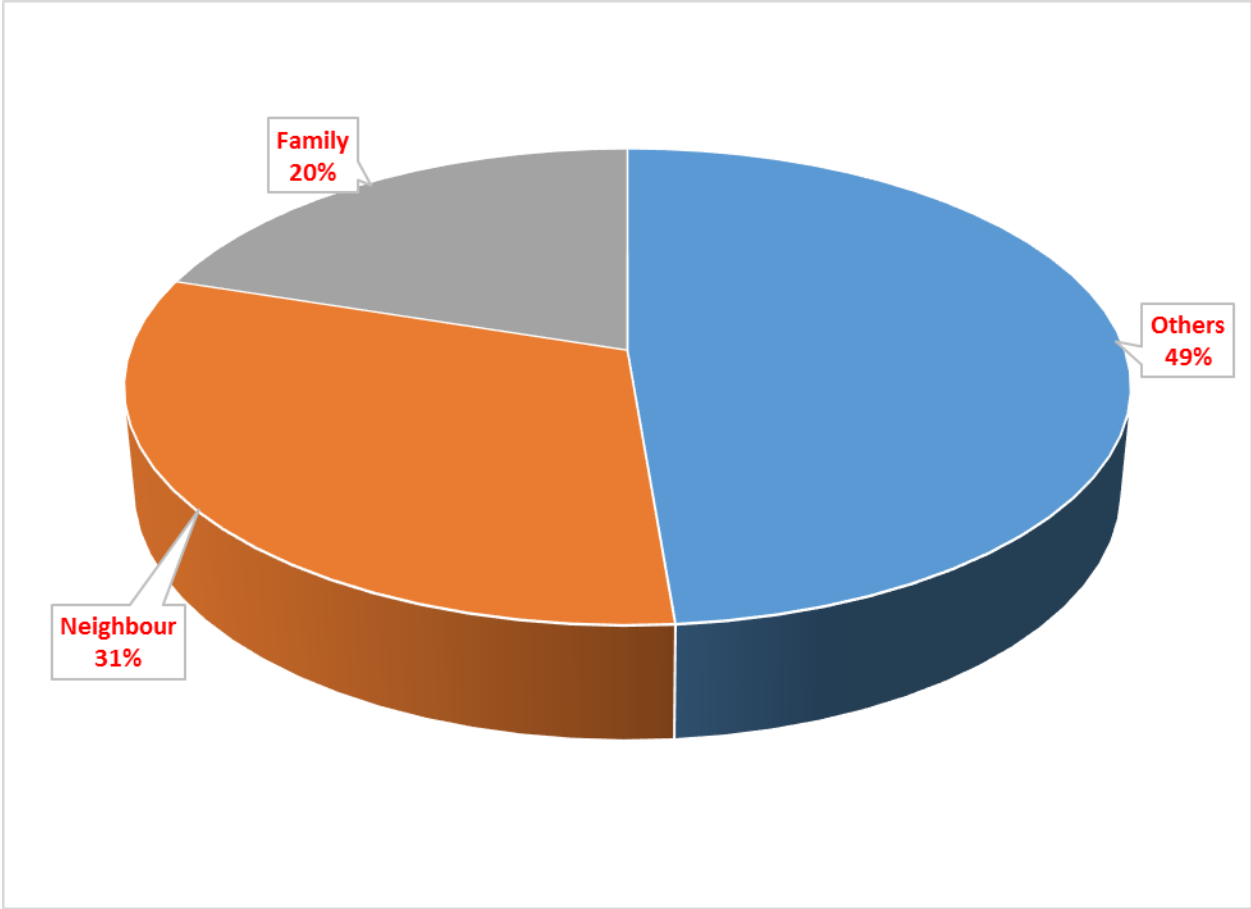


Table 19: Social Capital scale by different characteristics

		N	Others	Neighbors	Family	Chi-square
District	AMURIA	536	45.5	30.0	24.4	111.09 (p<0.0001)
	BUDUDA	452	63.9	29.2	6.9	
	HOIMA	762	47.1	33.2	19.7	
	LAMWO	250	32.8	32.0	35.2	
Gender	Male	1,019	51.3	32.3	16.4	17.13 (p<0.0001)
	Female	981	46.0	30.3	23.8	
Marital status	In Union	1,553	50.4	31.5	18.2	
	Not in Union	447	43.0	30.7	26.4	
Age groups	18-35	882	46.7	31.3	22.0	14.0 (p=0.007)
	36-50	659	51.8	33.1	15.2	
	51 plus	444	48.7	29.1	22.3	
Settings	Rural	1,252	56.0	25.4	18.6	77.0 (p<0.0001)
	Urban	748	36.5	41.2	22.3	

6.12 Human Capital dimension

Five indicators were used to estimate human capital scale as indicated in Table 20 below. Three quarters of the households (76%) had not experienced any school dropouts. Almost all households (92%) had access to schools in their area within a five kilometer distance. Majority of the respondents (93%) reported lack of formal employment by their household heads. Seventy two percent of had either primary or no formal education at all. Three out of 10 had access to vocational training in their districts. However, all these indicators were unable to contribute significantly to human capital scale. Highest level of education was therefore used to finally represent this dimension.

Table 20: Human Capital indicators

Attributes	Variable Type	Percentage of HH N=2020
Drop out of school	No/Yes	75.8
School with 5 km	Yes/No	92.3
HH head with formal employment	Yes/No	6.4
Access to vocational training	Yes/No	30.5
Highest Education***	No schooling	15.9
	Primary	56.3
	Secondary O level	20.4
	Secondary A level	2.5
	Tertiary	4.5
	N/S	0.5

*** The only variable used to represent human capital because of low Chronbach's alpha value, this was standardized finally before use

6.13 Combining dimensions

At bivariate level, all the scales were summarized and compared either by district or setting, rural/urban. As indicated in Figure 11, Hoima district had the largest average scale for wealth and health. Amuria scored high on governance, Bududa on agriculture and Lamwo on both social capital and infrastructure dimensions.

Figure 12 clearly shows households located in urban with the largest score on wealth and health, while for rural it was mainly agriculture.

Spider Graphs

Figure 11: Resilience dimensions in the context of insufficient food

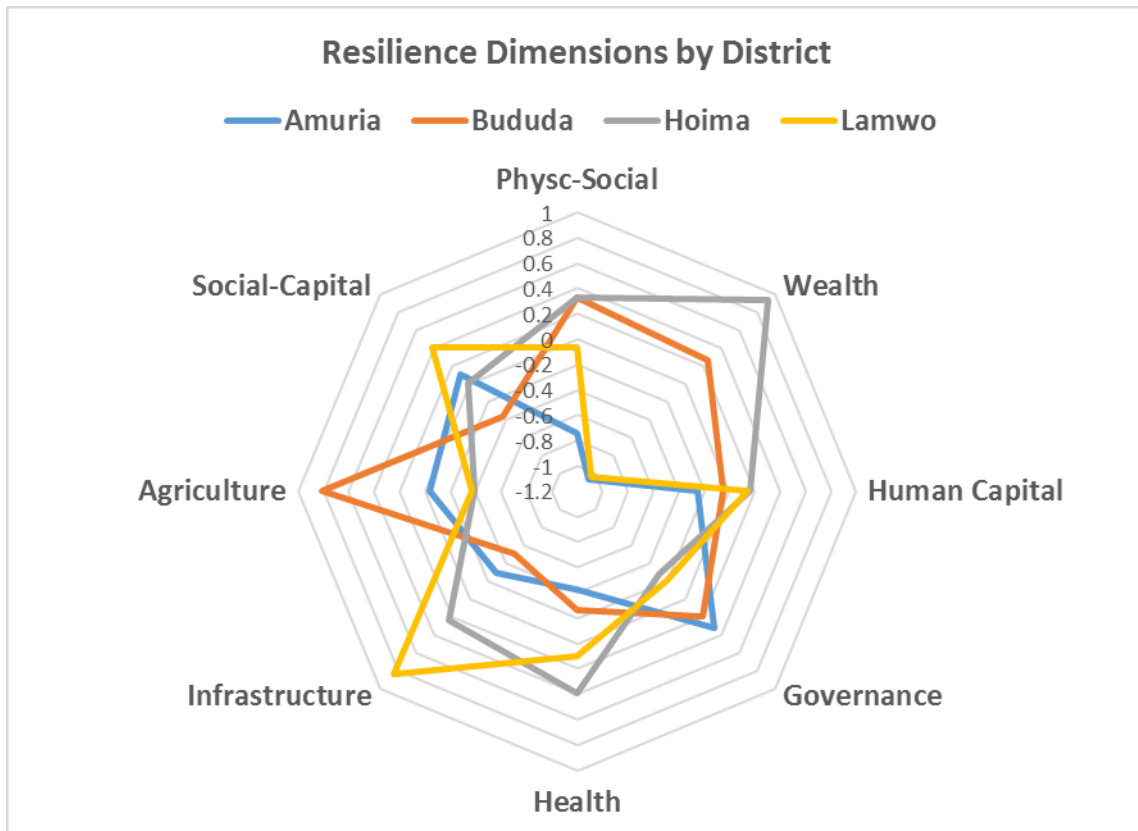
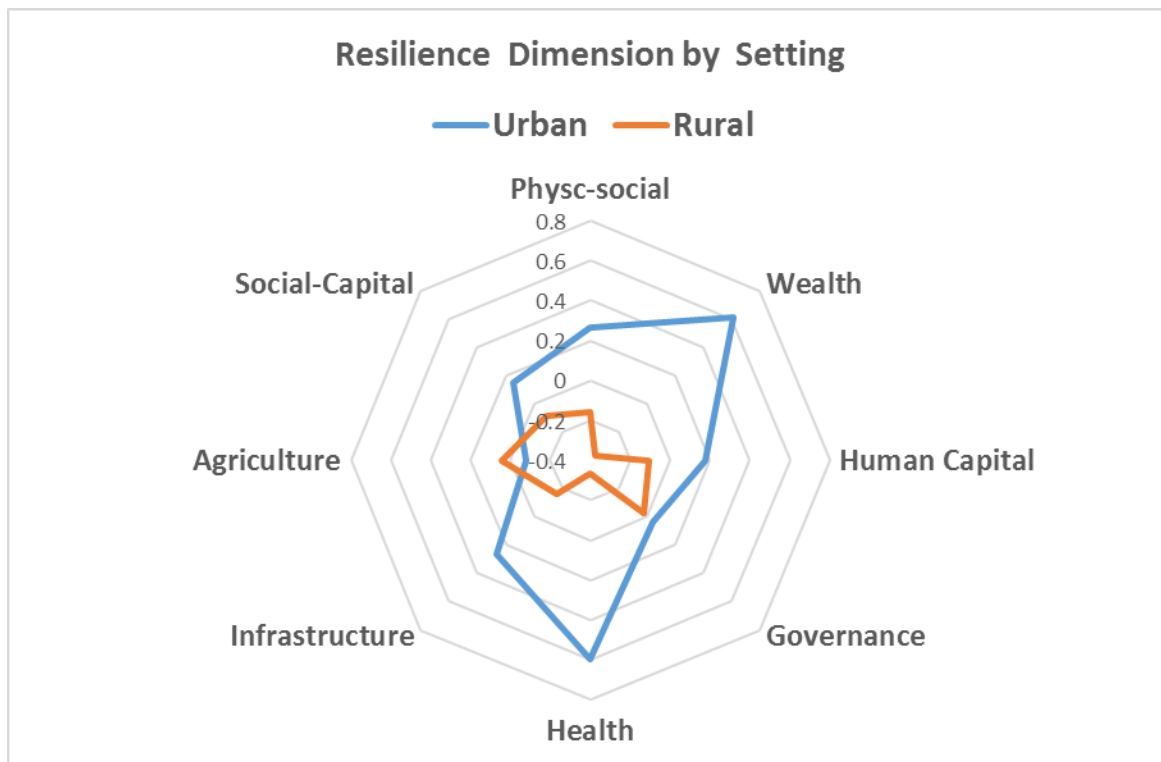


Figure 12: Resilience dimensions by district



6.14 Multivariate analysis/Pathways

Linear regression was also applied to see a relationship between psychosocial, wealth and health as the main outcomes as indicated in figures 1 and 2 keeping others as independent predictors. Although environment was identified as an underlying factor from qualitative research, quantitative data was unable to estimate it and it was omitted in the analysis.

6.14.1 Wealth dimension scale outcome

Table 21 below clearly indicates a positive linear relationship between wealth and psychosocial wellbeing, agriculture, infrastructure, and human capital such as seeking support from neighbors (social capital) dimension scales. Although governance was negatively associated with the wealth dimension scale, the relationship was not statistically important. Psychosocial wellbeing, agriculture, infrastructure and human capital were significantly related to the wealth dimension

scale. Seeking social support from neighbors had a positive none significant relationship with wealth taking into consideration other dimensions.

Table 21: Regression coefficients for Wealth scale

Characteristics /scale	Coefficients	95% CI
Psychosocial	0.248	(0.209, 0.288)
Agriculture	0.219	(0.163, 0.275)
Governance	-0.030	(-0.082, 0.022)
Infrastructure	0.182	(0.124, 0.240)
Social capital (Neighbors/Others sources)	0.136	(-0.024, 0.295)
Social capital (Family/Other source)	-0.055	(-0.248, 0.138)
Human Capital(education/ No education)	0.875	(0.709, 1.014)
Female/Male	0.184	(0.038, 0.329)
Age	-0.002	(-0.003, -0.001)
Constant	-0.316	(-0.456, -0.176)

6.14.2 Health dimension scale outcome

Health dimension was significantly predicted by wealth, psychosocial wellbeing, agriculture, governance; infrastructure and part of social capital (Table 22). According to these data, there was a negative significant relationship between agriculture and health dimension scales.

Table 22: Regression coefficients for health scale

Characteristics /scale	Coefficients	95% CI
Wealth	0.088	0.025, 0.150
Psychosocial	0.107	0.055, 0.158
Agriculture	-0.084	-0.157, -0.011
Governance	0.207	0.141, 0.273
Infrastructure	0.259	0.185, 0.334
Social capital (Neighbors/Others sources)	-0.008	-0.212, 0.196
Social capital (Family/Other source)	-0.330	-0.572, -0.088
Human Capital(education/ No education)	0.112	-0.108, 0.332
Female/Male	0.014	-0.170, 0.199
Age	-0.001	-0.002, 0.001
Constant	-0.085	-0.267, 0.098

6.14.3 Psychosocial dimension scale as an outcome

Apart from social capital, all the remaining dimension scales were positively associated with people's psychosocial wellbeing in those communities. Social capital as a source of support during disaster was negatively associated with people's wellbeing.

Table 23: Regression coefficients for psychosocial scale

Characteristics /scale	Coefficients	95% CI
Health	0.113	0.058, 0.168
wealth	0.341	0.279, 0.403
Agriculture	0.118	0.043, 0.193
Governance	0.114	0.045, 0.182
Infrastructure	0.113	0.035, 0.190
Social capital (Neighbors/Others sources)	-0.216	-0.426, -0.006
Social capital (Family/Other source)	-0.025	-0.275, 0.225,
Human Capital(education/ No education)	0.250	0.024, 0.476
Female/Male	-0.272	-0.461, -0.082
Age	-0.002	-0.003, 0.000
Constant	0.178	-0.009, 0.366

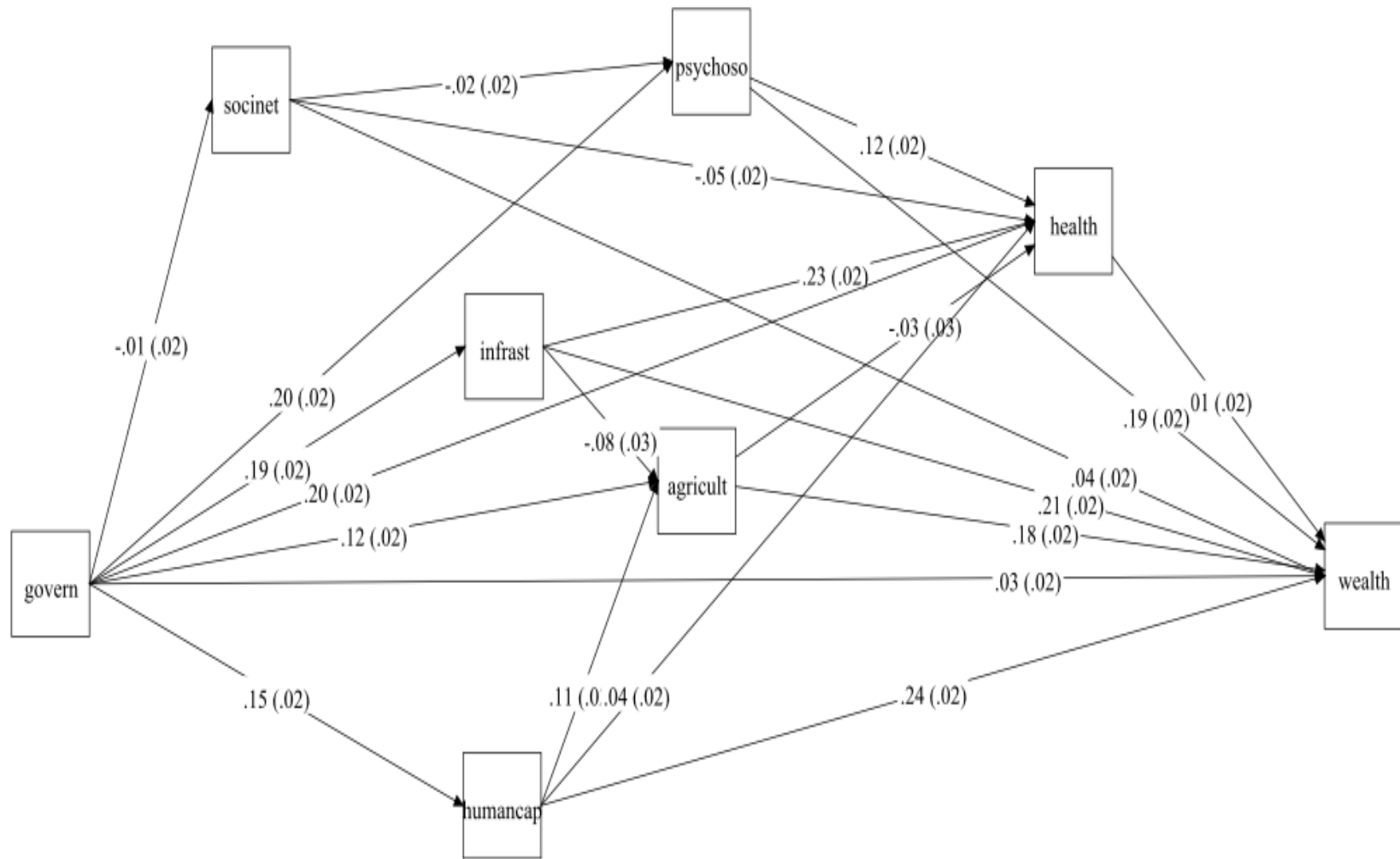
Figure 13 presents results from SEM that clearly define the resilience pathways. This analysis clearly indicates a positive relationship between wealth dimension scale and other scales namely; governance, human capital, agriculture, infrastructure, health, social networks and psychosocial wellbeing.

Apart from agriculture and social capital dimensions, the rest are statistically positively associated with health dimension scale.

For the psychosocial wellbeing as an outcome, all the dimension scale with exception of social capital are positively significantly related to it.

Among the indirect outcome scales, governance is negatively related to social capital, similarly agriculture and infrastructure statistically inversely related as indicated in figure 13 below.

Figure 13: Estimates from structure models for the climatic variability



7.0 Discussion

This section is linking mainly the quantitative findings and the initial results already generated from community consultations and qualitative survey. The findings were presented based on the dimension scale from the two theoretical models generated from climatic and prolonged conflict stressors.

Wealth dimension:- According to the community interviews/qualitative, this dimension relies on both financial and non-financial assets, access to credit, and elements that improve peoples' livelihoods such as sources of income (formal and informal), shelter and levels of out of pocket payments for the expected free services (corruption). The presence or absence of any of these attributes determines greatly the wealth status of a particular household and community.

Mobile phones, mattresses and radios are some the highly distributed household assets in the four districts. For the mentioned assets, Lamwo and Amuria had the biggest number of households without them. These two districts lie in Teso and Acholi sub-regions that were affected by the prolonged conflict that were characterized by property loss and displacements.

In general, ownership of transport means in household is low. Bicycles are mostly found in Amuria followed by Lamwo and least in Bududa districts. Hoima has the highest proportion of households with cars/motorbikes (19%). Limited means of transport in a household limits access to suitable markets and creates reliance on middlemen during trade of commodities, a challenge that was also identified in the previous community consultations. Almost 7 out of 10 household rely on middlemen for agricultural produce.

In terms of housing materials, almost all households in the 4 districts have unimproved floors, this may have a direct effect on sanitation and hygiene and consequently on people's health. Ill health further predisposes households to poverty due to medical costs and productive time lost while attending to sick household members.

In relation to economic activities, almost one out of 10 households had a salaried member, an indicator of unreliable source of income. This might be attributed to a high proportion of members (72%) with either primary or no formal education in these communities. Similarly, ownership business in a household was as low as 30%, this was worse in the conflict affected districts. On the other hand access to loan in these communities is fairly high. This was also observed during the community consultations where members report a rapid increase in the number of village saving groups aimed at raising livelihood income.

Health dimension: From community consultations, this dimension was linked to illness, physical and financial access to health services, quality of services at facilities, drug availability and stressors such as droughts.

Data from the four districts clearly indicate that 7 out of 10 households reported atleast a sick person in the past one month. Quality of services was perceived to be on average and this has a direct impact on access.

In relation to time spent to reach a health facility, Amuria and a Lamwa respondents seem to take more 45minutes. Range of services offered at the facility was also perceived to have a direct relationship to the way communities view health dimension. Apart from Amuria, more than half of the respondents in the 3 districts, do believe that multiple range of services at the facility facilitate access to health services. As indicated in Figure 6, large proportion of households in the lowest health scale, do exist with a list of factors that influence health in their respective communities.

Culture was mentioned to be one of the facture hindering health issues in the communities. However, the quantitative data does not support this notion. This could be due to the way the two communities interpreted it. In addition to that, insurance is almost no existing in the four districts.

Psychosocial dimension: Psychological status especially of a household head impacts a lot on the attitude and response to shocks and stressors in a community. It includes also the ability of resumption of *normal life* after a disaster. Data on this dimension scale was collected based on the way members felt about themselves and communities in terms of other wellbeing. It was clearly observed 6 out of 10 respondents rated their lives to be either average or below. A given fraction of respondents have not either adapted to stressors or they feel dissatisfied with their lives. Almost all individuals were defeated by the various stressors. As observed from the qualitative findings, there is a need for government and other NGOs to provide continuous counseling support services to communities that are affected by disasters. Developing programs that lead to group and peer counseling can a sustainable program. This can also be integrated in the education systems for all the schools located in such districts. Data further shows that during disasters, people normally run to family members, police, churches and NGOs. Strengthen family ties and communities is an important tool therefore that can be used to improve people's psychosocial wellbeing. Encouraging communities to form social and financial support groups can be one of the avenues. There is a need to understand further how communities can be further bonded together in order to come with appropriate community engagement techniques. This can be done by just consulting few community and opinion leaders in the area. Provision of life savings skills to communities can also

contribute to a reduction in the psychosocial wellbeing. This aspect is necessary since almost all members have never adapted to stressors.

Agriculture dimension: Like many other developed countries, Uganda also still depends on agriculture. According to community discussion, residents grow a narrow range of crops for subsistence and partly income generation. Agricultural practices and farm inputs contribute a lot to their yield. Communities also keep livestock and poultry for the same purpose. Households' responses clearly indicate the presence of crops, livestock and poultry in these communities. However, during the sale of their products, most of the households still rely on middlemen, which is likely to result in reduced income.

Soils in these communities were rated as average but utilization of fertilizers was reported to be by almost a third of the households apart from Bududa where 4 out of 5 households mentioned it.

Data indicates low presence of agricultural extension services in these communities. Although community interviews especially from chronic conflict areas reported receiving agricultural support from government agencies such as NAAD and NUSAF, responses from Lamwo and Amuria districts seem to support this.

Governance dimension: This was one of the scales, community informants identified as a cross-cutting issue. It focuses mainly on the way political, economic, administrative and social issues are managed with the society at various levels. Less than half of the respondents felt that their involvement at both central and local governments was almost non-existent. Always their priorities are included. This implies that communities feel as if they are not part of the decision-making process at both local and central levels.

Although majority had never paid for a free service, they still feel that corruption does exist in the community. This is in agreement with the community responses, where corruption was mentioned especially in relief services in Northern Uganda and also settling land wrangles. Table 12 and Figure 7 clearly indicate that at different levels of the governance scale, there are high proportions of households that are likely to be observing corruption and land wrangles in their communities. Community informants mentioned that proper sensitization campaigns on programs are very important for them to clearly judge the effectiveness of government programs.

Infrastructure dimension: Community discussions identified roads, bridges, boreholes, housing conditions and markets as social assets that help to improve productivity in their respective areas. Communities usually come together during construction or maintenance of these assets. Quantitative data clearly shows that communities are not satisfied with their road networks and bridges as they are just at an average scale. Similarly, the construction materials are also not rated very well, this could be

related to shocks stressors experienced. For the communication systems, poor infrastructure can also be associated with governance. It is therefore important to look at all the dimensions not in isolation.

Social Capital: In-depth discussions identified networks as one of the sources that help societies to recover from stressors such as conflicts or climate related. Families move to their relatives after disaster to seek some support. Household data clearly indicates that other family members, neighbors, institutions like police and churches as the immediate sources of support during disaster.

In all the 4 study districts, almost 7 out of 10 households (table 4) have access to loan services in their areas. This could attribute to formation of different groups to enable their members access funds from either government or other support organizations.

Human Capital: According to community interviews, human capital from these communities were based on access to formal education and, availability of vocational training in the areas. These help individuals to gain knowledge and skills that can be used to improve peoples' livelihood.

Evidence from household survey clearly shows a big gap in formal education in these communities. Close to three quarters of the respondents had either no formal education or stopped in primary school. Similarly, few households also reported access to formal education. This could be attributed to the stressors but also other dimensions such as governance, infrastructure and others identified by RAN and the EA RILab.

Pathways: Results for both linear regressions and SEM generally lead to some common conclusions. Using the three outcomes, human capital and infrastructure and the two dimension scales that are positively significantly related to wealth, health and psychosocial dimensions. Again, the two methods show a negative relationship between social capital and health dimension scale. For the wealth outcome, social capital was considered as a categorical variable and there a positive relationship between respondents who reported to consulting neighbors during disaster compared to other sources and wealth. SEM findings also draw a conclusion which is in the same direction. The regression coefficient for governance describes an inverse none statistically important relationship with wealth dimension scale (Table 21). The SEM results show on the other hand a direct positive relationship. However, governance is negatively associated with social capital. But governance through social capital leads to a positive linkage with wealth. Agriculture dimension is negatively related to health based on results from the two statistical methods. In general these two statistical approaches produce similar results. This data

therefore shows a clear link to the pathways developed from the theoretical models and hence their strength in explaining the resilience dimensions.

One of the limitations from this work is that, data analysis was combined yet different districts face different stressors and shocks. In the subsequent analysis, district specific dimensions scale analysis will be combined. The data did not bring out clearly a clear measure of natural resources environment, this requires further discussions with the communities in order to come-up with other sensitive variables.

However, this survey used various methods of advanced data analysis which led to conclusions that are generally in the same direction. The pathways clearly show clear directions in predicting the outcomes. This implies that, as interventions are planned, there is a need to focus on almost all dimensions more so by focus on clustered variables within each dimension scale for better results. Even within the dimension, there is a need to identify pockets of variable that are sensitive and can lead to immediate change in people's lives as a way of becoming further resilient to shocks and stressors. For dimensions, such as human capital, and social networks, the drivers are already know. This required all the relevant authorities to start intervening in order to improve people's lives. Education levels of all respondents in the 4 communities were almost primary on none. This sends a big question about human capital development interventions that do exist in those 4 districts.

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Appendices

Appendix 1: Unrotated and rotated factors for the final wealth scale

Indicators	Un-rotated			Rotated		
	Compnent1	Compnent2	Compnent3	Compnent1	Compnent2	Compnent3
Mobile phone	0.366	0.2593	-0.0685	0.366	0.2593	-0.0685
Radio	0.349	0.1715	-0.2873	0.4768	-0.0564	0.0569
Mattress	0.3301	0.2039	-0.4211	0.5431	-0.1772	0.0393
Bicycle/ Wheel barrow	0.0824	0.7007	0.2477	0.0785	0.0346	0.7428
Electricity	0.3587	-0.1708	0.2183	0.1298	0.4265	-0.0821
Improved roof	0.3748	-0.4292	-0.2199	0.3312	0.1814	-0.4801
Improved floor	0.3559	-0.2589	0.379	0.0192	0.5706	-0.1069
Improved toilet	0.2629	-0.0554	-0.2081	0.315	0.0166	-0.1266
Salary HH	0.1963	-0.0701	0.5984	-0.1905	0.5859	0.148
Own business	0.2486	-0.0354	0.02	0.1808	0.1735	-0.0263
Loan access	0.2512	0.2849	0.1807	0.1622	0.2039	0.3302

Appendix 2: Unrotated and rotated factors for the final psychosocial scale

Indicators	Unrotated		Rotated	
	Comp1	Comp2	Comp1	Comp2
Current health rating	0.2896	-0.253	0.3838	0.0249
Satisfied are you with your life as a whole	0.3687	-0.1365	0.3576	0.1633
Felt unable to control the important things in life	0.2606	0.298	-0.0255	0.3951
Confidence about handling personal problems	0.327	-0.4034	0.5163	-0.0553
Felt things were going your way	0.3264	-0.365	0.4888	-0.0285
Felt difficulties were piling up so high	0.343	0.157	0.1324	0.3532
Usually see solution to problems and difficulties	0.2853	-0.3371	0.44	-0.0377
Feel defeated by the stressors	0.3379	0.335	0.0032	0.4758
Extent of recovery from stressors	0.3304	0.3497	-0.0125	0.4809
Adapted to living with the main stressors	0.2765	0.3997	-0.0859	0.4784

Appendix 3: Unrotated and rotated factors for the final Agriculture scale

	Unrotated		Rotated	
	Component1	Component 2	Component1	Component 2
Livestock	0.5123	-0.3794	0.6371	0.0226
Poultry	0.5078	-0.4198	0.6587	-0.0118
Grains & food crops	0.2555	-0.272	0.3693	-0.0534
Use fertilizers	0.4456	0.3695	0.1182	0.5667
Protects stored food	0.3093	0.5454	-0.0981	0.6193
Receive extension services	0.3466	0.4146	0.0126	0.5402

Appendix 4: Unrotated and rotated factors for the final health scale

Variable	Un-rotates			Rotated		
	Comp1	Comp2	Comp3	Comp1	Comp2	Comp3
Distance to health facility (in 5km)	0.1179	0.3686	-0.4889	0.4067	0.123	-0.4563
Time to nearest health facility (with 45min)	0.2423	0.4565	-0.0784	0.5157	-0.0504	-0.0693
Perceived good quality of service	0.4221	-0.3745	-0.3514	-0.0175	0.6643	-0.0196
Long distance influence access	0.3362	0.4429	-0.0072	0.5546	-0.0165	0.0374
Transport cause a problem to access	0.3331	0.3613	0.1455	0.4744	-0.051	0.187
Range of service not a concern	0.3827	-0.1374	0.0531	0.1136	0.303	0.252
opening hours convenient	0.306	-0.0683	0.3846	0.0946	0.0462	0.4849
Poor quality of service does not hinder access	0.4221	-0.3745	-0.3514	-0.0175	0.6643	-0.0196
Long waiting time does not affect access	0.2638	-0.0119	0.4493	0.109	-0.0456	0.5076
Medicine and supplies available	0.1933	-0.1577	0.3661	-0.0424	0.0299	0.4399

Appendix 5: Unrotated and rotated factors for the final governance scale

Variable	Unrotated	Rotated
	Component 1	Component 1
Gov't decision includes my priority	0.5954	0.5954
Local governments care about us	0.5669	0.5669
Central gov't decision includes my priorities	0.5484	0.5484
Never paid in any form for a local free service	0.1526	0.1526

Appendix 6: Unrotated and rotated factors for the final infrastructure scale

	Unrotated		Rotated	
	Component1	Component 2	Component1	Component 2
Bridges/Roads	0.5795	-0.3341	0.6687	-0.015
Rating of bridges/roads	0.5742	-0.368	0.6804	-0.0474
Distance to main road	0.3989	0.1803	0.2634	0.3496
Floor materials	0.36	0.5314	0.0608	0.639
Wall materials	0.2141	0.6618	-0.1298	0.6834

Appendix 7: Consent form in the local languages

A FOOMU NA ACAMUN – (CONSENT FORM for Amuria-Teso)

Itodiare

Erai asioman naa na ikamunit iponesio lu itereikina keda atiokisio nuka elongilong kede eijul lo ekuse lo ikwamin kotoma Uganda. Itolosio asioman na kodistriktan iwongon luko Amuria, Bududa, Hoima kede Lamwo lu atakananikisi atiokusio kwape; elongilong, ebulone, akamu na ewoja araibo nat atianakin naa alupok. Eponio aitwasam aomisio nuu aideleleun aiboisio/akiro ka apeleunia acoasinei/iwaitin nu kitemokinet ka aitigogong iponesio lu aikwarun kotoma na atiokisio nu elomanakinitos itunga lu aibosit kana

Lo epolokit aisisia na ngesi Prof. William Bazeyo, lo apolon osomero kalo Makerere University School of Public Health. Ice lu ejaasi aisisia na kesi Dr. Simon Kasasa, Mr. Nathan Tumuhameye, Dr. Julius Sentongo, Dr. Roy William Mayega, Dr. Dorothy Okello and Ms. Grace Bua. Edaun aitetemikin ijo apelekinet na aisisia na, ka abongonokin akon aingesta kasodi ijo acamun ajaun toma aisisia na, iponi alipit ijo aidokokin akan afoomu na itodunit ebe icamunit ijo ajaun toma aisisia. Ido ijaikino ijo ekopi lo apapula kana. Ido da ajaun aisisia na arai aseunet kon, ido ipedori ijo ainger edio sawa. Eyangaikin nepetai adakikan 45.

Apolou na aisisia ana

Apolou na aisisia ana erai anu ajenun eipone lo epatanikitor atiokuso atakaninikin oni kede eipone lo ipedora oni aipikor kesi, ikamanara kede elongilong lo epolo noi arai bo nat aijulanakineta nu ikwamin kwape nat aicaa kede aitep na edou. Oraun do atenu na itijenikin oni apoloo kede ajenun epone lo ipikoret atiokuso ngun kede ajenun nu ebeit aswam anu aitigogong aipikor kotoma atutubet ana esekutai

Ationus na emina atakanun

Mam eomitai ebe ebuni asioman naa ayaun ationis na epol ne ejasi abongonikinak kotupitete aisiitinikin kesi iboro luu apotu kotakanuutu akaulo naa engeso, elongilong ka icie lu kopotu kolomakisi atutuben kec kosodete ayaun aitoronaarit kede ileuc kane ejaasi icie. Kejaa ngun daa, imuno ebe ajaun aitoswam eingarenok lu ko distrikta toma asioman naa. Imuno ebe ebuni asioman naa aitidisiar akuriaun arai ailongilonguun naa aomisio akaulo na ationis atakanikin ijo. Ijeni daa ebe akiro nu ebeit aimor kaane epedorete ajaun keda akiro nu epugaye ido emina ayaun aiyalongong nee ejai atutubet naa itoloseere asioman kwape nat abuur ijo kotomana alupok kon. Eja ngun da, ainingosia nuu epedorio aitwasam aitigogong eipone lo emisiikinere atiokisio ka ainingosia nu etakananikinete itunga ajar kec kana ngin paaran.

Ajokisio

Ajokis na aingic ana ngesi ebe ebuni aitogongo itunga atutubena keda eipone lo tetet lo aite atiokisio kede awayun inyoika iboro ejaikisi aiyatakin aija okidin naka atiokisio.

Ajaun otoma aingic

Erai ajaun otoma aingic na akon asekunet. Arai iseku ijo ebe mam ijo ikoto ajaikin toma aingic na, ijatator ijo apedor na alemar edio sawa. Emameunos da adis ajokisio nu ibuni ijo atwaniar.

Aigada na abogonikineta

Eraunos abongonikineta nu ijaikini ijo isio nu esalakinete otunga lu eutasi aswam aingic na, mam da itejenikino arai alimokin idis itunganan yeni okinga. Keja ngun da, mam ipodori amamus ingit ijo ekiror kon narai isekunit oni ekon ekiror ne etunga ne ebeit ingitgit. Keja ngun da, epaikinete abongonikineta kon keda atukot na RAN.

Aicunyakin / aidokokin akan

Aidokokin akan kon itodunit ebe edautai aitijenikin ijo akiro nu aisisiaana nu da icamuni ijo ilope aimor omamei abuikin be idau ijo aingit aingiseta nu ikamunitosi aisiom na kede da be akiro nu adaun aimor kede jo alacakisi jo acamun aimor aomisio kotoma aisisia ana. Adokokin a kon akan a foomu naa emamai ekisil lo ebilakini ijo. Apapula na adope esalakinete kede ijo.

Ekiror.....adokokin aka.....
Aparit..... Esimu.....

Ekiror agican.....Adokokin akan.....
Aparit..... Esimu.....

Ituganan ne ipedori ijo adolokin arai ejai aigiset arai ationise na ikamunit aigic na:

1. Prof. William Bazeyo
The principal Investigator
Telephone contact

2. Dr. Suzanne Kiwanuka
The chairperson of the IRB
Telephone Contact: 0312 291 397

3. Mr. Nathan Tumuhamy
Director EA RILab, RAN
Telephone contact: 0774 089 463, 0700 842 31
Yalama

CONSENT FORM for Hoima- Runyoro

INTRODUCTION

Omusomo gunu gukuseera obuceke no kugumisiriza ne bintu abikwatagaine no butabanguko rundi okuhinduka hinduka okwobwire mu Uganda. Omusomo gunu gukugenda mumaiso mu masaza 4 i.e Hoima, Bududa, Amuria na Lamwo agatungire obutabanguko obuhinguraine, amaizi kusandara na landslides ne kyanda ekyamaani. Byona ebitukugenda kubaza hanu nibija kukozezebwa omukukoma ebicweka ebisemerire mu kiyiya amagezi agaragumya nokutangira ebikangabwa ne bikutalibaniza mu byaaro binu.

Akuura okuseruliriza kunu niba mweta prof. William Bazeyo, Dean of Makerere University School Of Public Health. Abakumukonyera banu Dr. Simon Kasasa, Mr. Nathan Tumuhamy, Dr. Julius Sentongo, Dr.Roy William Mayega, Dr. Dorothy Okello na MS. Grace Bua.

Hanyuma yo mugaso gwokuseruliriza kunu tugusoboroire, ebikaguzo byawe bigarukirwemu, kandi oikirize okwetaba, nitwija kukusaba oteke omukono ha rupapura runu. Nitwija kuha copi oyorayahura. Okweyunga kwawe mu muntekaniza enu eri yo bugabe kandi oina obusobozi okurugamu obworaba otankwenda ekbikaguzo binu nibigenda kutwara edakiika 45.

PURPOSE OF THE STUDY

Ekgenderwa kyomusomo gunu kiri kyo kuseruliriza obuceke ne bintu abikwatagaine no butabanguko rundi okuhinduka hinduka okwobwire mu Uganda nkomusinge okuratukonyera okutumbura erukwija okutukonyera okurwanisa nokugumya ebicweka binu.

RISKS

Okuseruliriza kunu kukusobora kuleeta obuzibu butito hali weeni arukugarukamu, nikirugiira hakwijuka embeera embi eyabaireho mu byaaro ebi e.g okusandara kwa maize, okubarukaho endwara, okujunaana no kwe ijukya okwa bantu.

Baitu, kusigikira abakuru mu isaza rinu nibanibirwa okweyunga omu musomo gunu, nikinihirwa nti kija kukendeza ebiratalibaniza obwongo. Nikimanyibwa nti ebimu ebirabazibwaho biija kuba birimu ebyobulemi. Kandi bisobora kuletaho obutiini mubikweka ebigambirweho. Eg obyobulemi ebikwatagaine no kubinga abantu omu itaka lyabu. Kyoka, okugezesabwa kunu nikwija kutukonyera mukugumya nokutusobozesa mukwetegereza ebizibu ebyo ebyenyini no kugezesabwa okwebyaro gubiramu bulikiro omubwomezi bwabu.

BENEFITS

Enfuna mukuseruliriza kunu nikwija okuha obusobozi ebyaaro binu okutunga okuhinduka okuhyaka hali obuceke bwabu nokutekereza ahabwaki bakugumisiriza mubuceke bwabu. Kyonka amakuru gabaratuha go kwegendereza habwokuba nigaija kukozezewa nekitongole ekya RAN okweyongera okuyiya ebintu ebirayombeka obugumu mu byaaro binu hali ebikangabwa ne mitalibaine emanyirwe.

PARTICIPATION

Okwetaba kunu kuli kyokugonza kwawe. Obworaba nohura otakwenda okwetaba mukuseruliriza kunu, oina obugabe okulekera aho haka kaire koon. Tihaloho ekyokwija kufeerwa.

CONFIDENTIALITY

Byona ebyo ragarukamu biija kumanywa abarukukora ha kuseruliriza kunu kandi tuija kubyahura nke nsita. Kyonka, tikija okulemesa aba kujunanizibwa batanyire babwokuba bali bamu abakakomerwe. Kyonka, ebibakugarukamu nibiija kumanyibwa aba RAN kandi baja kubirinda nke nsita.

AUTHORISATION TO USE AND DISCLOSURE OF YOUR INFORMATION.

SIGNATURE

Okuteekaho omukono hansi hanu nikimanyisa nti ogambirwe obikukwatagana nokuseruliriza kandi oyegondiize okweyunga. Okagwize obikaguzo hakuseruliriza kunu kandi amakuru ganu agakuhairwe gakuha orukusa oku okusaramu okweyunga mu kuseruliriza kunu.

Okutekaho omukono gwa we harupapura runu,.....

Ojakusigazaho copy

IFOMMU ISABA LUKHUSA (Consent Form for Bududa-Lumasaba)

Kumusomo kwekhulikho kuno, Khuli kuwetsa khuseesa ingeli isi babandu banyala ukhwisibwa naabi inyuma atwela ni khukumila bikhohwa birelebwa tsindalo namwe ishukhashukha

iye'tsimbela tsemwikulu binyala byarela tsihururwe, shimiya ni kumukhururo kwe kametsi mubiffo burawa ano m'Uganda. Kumusomo kuno kuli khukholebwa mu tsi'distulikti tsine m'Uganda aali Bududa, Amuria, hoima atwela ni'Lamwo, tsekhumanyile ilala khuri tsindala tsabirisibwa buubi mu bikhwolwa bye tsindalo, kumukhururo kwe kametsi, tsikhururwe namwe shimiya. Bina'ama mumusomo kuno kane biyete khurera kamakyesi kamashakha kanayeta babandu khukumisa khukhupanisa tsimbela tsirelebwa ni bikholwa bitsinisa babandu byekhwama khukanikhakho agakya.

Umurangilisi uwe'kumusomo kuno niye Purofesa William Bazeyo nganiye Ukhulila shitongole shi timilila bye'bulaamu bwe babandu i Makerere univasite. Balikhuramba atwella ninaye nibo Dokita simon Kasasa, Umukoosi Nathan Tumuhanye, Dokita Julius Ssentongo, Dokita Roy William Mayega, Dokita Dorothy Okello atwela n'Umukyelama Grace Bua.

Nga bamalile khukhubolela shikyendelelwa she kumusomo kuno amala wafukyilisa ukhwituba mukhwilamo birebo, kane khukhusabe wisekho kumokhono kwowo inyuma we'fomu yino lufanyuma khukhulekhelekho ifomu yowo ne ikyindi khukyiramise. Ukhwituba mumusomo kuno shili isi wamwene ukhwikanisa ate unyala wakhalawo wakhubolela khwakamisa khukhurebelesa. Inganikha yeffe ni naawe inyala yaila tsindakhika nga 45.

shitsilililwa she kumusomo kuno

Khulikhukana Khusesa ingeli isi babandu banyala khukhosebwa lufanyuma beyandalisa atwela n'ukhwikhalilikha bikholwa birelebwa ni tsindalo namwe ishukhashukha irelebwa ni tsimbela tse mwikulu binyala byarela tsihururwe, shimiya ni kumukhururo kwe kametsi mubiffo burawa ano m'Uganda no khunyalise khura atwela kamakyesi kananyalisa khurawo ingola iya buraawa ikane ikumise babandu khunyalisa khubira mutsimbela tsino.

binyala bya khuriisamo

Khurebelesa khuno khunyalisa khwakhushibusamo biangafu byesi wabiramo nga tsihururwe ni tsabakwila. Ne ukhiyembelela tawe lwekhuba kane khurambile atwela ni barangilisi benywe be khu distulikti bakane babakumye. Ni'shindi, khwamanyile khuri inganikha ikane iyambakane ni khuwonebwa kumarome kane ireremo ni bye bufuzi; wabula khuluwande lweffe, shino kane shikhuyete khumanyilelala biangafu byesi mubiramo mumbela tsenywe tsa busheye.

sho nafunamo mumusomo kuno

Unanyalisa khuba nitsambasa ishakha ikane Ibayete khumanya lwashina munyalisile ukhwikhalilikha biyangafu birelebwa ni tsihururwe, nga witubasile mumusomo kuno ni naffe. Shitongole shefe sha RAN kane nasho shitse ni'ngola iyaburawa ikane ibayete khukhupanisa ibyabolakho mubisela byo.

Khubikha bibyama

Byosi byesi unakhubolela, kane khubibikhe mushama. Ikane khubikukule osi tsana taawe! Khurusakho kane khukhulombe ukhuwe kamasiina kowo niyo khunyalise khumanya be khukanikhile nabo buli mushisitsa shesi kane khutsye. Khukhukakasa khuri bino byosi kane khubibikhe mushama nga ffe ba RAN.

Ukhwisakho Kumukhono

Ukhwisaho kumukhono kwowo khunokesa khuri bakhubirilemo biambakana ni kumusomo kuno bulayi ate kane ufine ikopi yowo iya buraawa.

Kamasiina

Komwikhali.....

Shankumu.....

*Tsinakhu tsye kumwesi..... Inamba yye
simmu.....*

*Kamasiina ko'mureebi.....
Shankumu.....*

*Tsinakhu tsye kumweesi..... Inamba yye
Simmu.....*

Kamasiina Ke Bakhama beffe

Khupa isiimu yoosi isi bakhama beffe be khureye asi ano sing'oboona ori uli'nibikhakhusangasile taawe namwe ngo kana ukhwireebakho shoosi khu musomo kuno:

1. Purofesa William Bazeyo,
Umurangiliisi uwe kumusomo kuno.
0414-543044.
2. Dokita Suzanne Kiwanuka,
Nashitsolongo Uwekhashiikho kha'sosola bye Khurebelesa.
0312-291397.
3. Umukoosi Nathan Tumuhanye,
Dairekita Uwa RAN (EA RILab)
0774-089463, 0700-842317.

Wanyala Naabi.

Appendix 8: A questionnaire for assessing vulnerability and resilience factors associated with acute chronic conflict/climatic variability in Uganda

UGANDA SURVEY QUESTIONNAIRE
QUANTITATIVE

PART 1: IDENTIFICATION		
Household ID [][][][]	Enumerator ID [][]	Field Supervisor ID [][]
Date of interview	[][][] / [][][] / [][][] day month year	
Village		
Parish		
Sub-parish		
District		
Total number of households in a village	[][][]	

INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with Makerere University School of Public Health under ResilientAfrica Network (RAN) as a research assistant. We are conducting a survey about assessment of resilience factors in Uganda. The study is being conducted in the four districts of Uganda, namely Bududa, Amuria, Hoima and Lamwo that have experienced either conflict, floods, landslides or prolonged drought. The information we collect will be used by RAN to identify possible areas for innovations that build resilience of communities to specific shocks and stresses. Your household was selected for the survey. I would like to ask you some questions about your household and the factors that have enables you to manage shocks from the previous disasters that have occurred in this region. The questions usually take about 45 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time. In case you need more information about the survey, you may contact [GIVE INFORMATION SHEET].

Do you have any questions?

Can we begin the interview now?

1 = Yes

2 = No

If Yes (respondent agreed), go to part 2,

If No (respondent did not agree), Thank the respondent and END

PART 2: DEMOGRAPHICS		
2.1 Respondent	[] []	01=Household head 02=Spouse 03=Son/daughter 04=son/daughter in-law 05=Grandchild 06=Other relative 07=Hired worker 96=Other (<i>please specify below</i>) Other: _____
2.2 Total number of persons in household	[] []	
2.3 Sex of respondent	[]	1=Male 2=Female
2.4 Religion	[] []	1=Anglican 2=Catholic 3=Moslem 4=Pentecostal 96=Other
2.5 Age of respondent in completed years	[] [] []	If don't know, enter 998
2.6 Current marital status	[]	1=Married 2=Never married 3=Widowed 4=Divorced
2.7 Highest level of education that you have ever completed	[]	1=No schooling 2=Primary 3=Secondary O level 4=Secondary A level 5=Tertiary

DIMENSIONS OF RESILIENCE

PART 3: WEALTH DIMENSION

3.1 What is your current employment status?	[] []	01=Employed full time 02=Unemployed 03=Housewife 04= Casual labour (non-agric., fishery) 05= Casual labour (Agric., fishery) 06= Business 96=Other (<i>please specify below</i>) Other: _____
3.2 What is the household's sources of earnings during the last 12 months? (respond to all)		
1. Salaries and wages	[]	1=Yes 2=No
2. Crop farming Enterprises	[]	
3. Other Agricultural Enterprises	[]	
4. Non-agricultural Enterprises	[]	
5. Net actual rents received from building/property	[]	
6. Net rent received from land	[]	

7. Interest received from current account	<input type="text"/>	
8. Interest from other type of account	<input type="text"/>	
9. Interest from other type of account	<input type="text"/>	
10. Pension	<input type="text"/>	
11. Sales from services	<input type="text"/>	
12. No income	<input type="text"/>	
13. Others (specify)	<input type="text"/>	
3.3 Of the above mentioned, what is the household's most important source of earning during the last 12 months (Choose only one)	<input type="text"/>	Please enter appropriate code above (Eg, 1=Salaries and wages,, 11=Sales from services)
3.4 Read out: Now we are going to ask you some questions about things that some households own. I'm going to read out a list of assets, please tell me if anyone in your household owns each of them.		
	(a) Does anyone in your household own the following? If No, go to next item If Yes for any, go to (b)	(b)
3.4 A. Household items	1=Yes, 2=No	How many?
i) -Mobile phone	<input type="text"/>	<input type="text"/>
ii) Generator	<input type="text"/>	<input type="text"/>
iii) Radio	<input type="text"/>	<input type="text"/>
iv) Mattress	<input type="text"/>	<input type="text"/>
v) Solar Panel	<input type="text"/>	<input type="text"/>
3.4 B. Livestock	1=Yes, 2=No	How many?
i) Small livestock e.g. chickens, rabbits, ducks	<input type="text"/>	<input type="text"/>
ii) Medium sized livestock – E.g. goats, pigs, sheep	<input type="text"/>	<input type="text"/>
iii) Large sized livestock – E.g. donkey, cattle <i>If No, go to section "C. Tools and machinery"</i>	<input type="text"/>	<input type="text"/>
iv) Do you use your livestock for agriculture?	<input type="text"/>	
v) Do you hire out your livestock for ploughing?	<input type="text"/>	
vi) Do you use your animals for transportation?	<input type="text"/>	
3.4 C. Tools and machinery	1=Yes, 2=No	How many?
i) Do you own hand tools for digging or weeding (E.g. hand hoe)?	<input type="text"/>	<input type="text"/>
ii) Do you own hand tools for cutting , e.g. hand axe, pangas)	<input type="text"/>	<input type="text"/>
iii) Do you own a plough?	<input type="text"/>	<input type="text"/>
iv) Do you own any powered machines, E.g. hand-tiller, tractor, or milling machine?	<input type="text"/>	<input type="text"/>
3.4 D. Transport	1=Yes, 2=No	How many?
i) Do you own a bicycle or a wheelbarrow?	<input type="text"/>	<input type="text"/>
ii) Do you own a cart for donkeys or oxen?	<input type="text"/>	<input type="text"/>
iii) Do you own a motorbike or car?	<input type="text"/>	<input type="text"/>
Non-Agricultural Household Enterprises/Activities		
3.5 Does any member of this household own/manage a business/enterprise?	<input type="text"/>	1=Yes 2=No <i>If No, go to 3.9</i>
3.6 If yes, what type of business does the member above own?	<input type="text"/>	01= Import/export business 02= Agricultural trade 03= Small enterprise (eg shops, kiosks, saloon, bar & restaurant) 04= Small factory 96= Other, specify Other: _____

3.7 Where is this business operated?	<input type="text"/>	01= Home inside the residence 02= Home outside the residence 03= Traditional/local market 04= Commercial shop 05= Other fixed places 06=Mobile 96= Other, specify Other: _____
3.8 What was the major source of funds for the business?	<input type="text"/>	01= Formal Banks (commercial/ development) 02= Micro finance institutions 03= NGO 04= Credit union 05= Landlord 06= Employer 07= Local group /SACCO 08= Relative 09= Friend 10= Local money lender
Loans and Credit		
3.9 Which sources can you get a loan/credit from? <i>(DO NOT READ OUT) Probe: Any other source?</i>	<input type="text"/>	01= Friends/relatives 02= Private money lender 03= Landlord 04= Employer 05= Bank 06= SACCOs/MFIs 96= Other (specify) Other: _____ 88= Don't Know 99= None
3.10 Has any member of this household sought for a loan/credit in the last 12 Months?	<input type="text"/>	1= Yes 2= No 88= Don't Know <i>If Yes, go to 3.12</i> <i>If Don't know, go to 3.14</i>
3.11 If No, what was the main reason for not seeking a Loan/credit?	<input type="text"/>	01= No need 02= Do not know where to apply 03= No supply locally available 04= Inadequate security 05= Interest too high 06= Don't like debts 07= Believed would be refused 08= Lack of sensitization 96= Other (specify) Other: _____ <i>Go to 3.14</i>
3.12 If Yes, what was the source of loan/credit? <i>Select up to 3 most recent sources</i>	<input type="text"/> <input type="text"/> <input type="text"/>	01= Friends/relatives 02= Private money lender 03= Landlord 04= Employer 05= Bank 06= SACCOs/MFIs 96= Other (specify) Other: _____
3.13 If Yes, what was the main reason for seeking the Loan/credit?	<input type="text"/>	01= Buy land 02= Buy livestock 03= Buy farm tools and implements 04= Start a business

		05= Purchase inputs/ working capital for non-farm enterprises 06= Pay for building materials (To buy house) 07= Buy consumption goods and services 08= To pay educ. Expenses 09= Pay for health expenses 10= Pay for ceremonial expenses 96= Other (specify) Other: _____
--	--	--

Household income for the last calendar year

3.14 What was the estimated total amount of income earned by your household from each of the following activities during the last calendar year? (Record all those that are applicable)

Income Sources	Amount	Income Sources	Amount
i) Food crop sales		vii) Salary/wages	
ii) Cash crop sales		viii) Fishing	
iii) Vegetable sales		ix) Alcohol Brewing	
iv) Casual labour		x) Rentals	
v) Livestock sales		xi) Other Specify	
vi) Pensions		Other: _____	

PART 4: AGRICULTURAL DIMENSION

4.1 What kind of food production/agricultural activities is the household involved in?	1=Yes, 2=No
i) Livestock production (cattle, goats, sheep, , etc.)	<input type="checkbox"/>
ii) Poultry production (chickens, ducks, geese, guinea fowl, etc.)	<input type="checkbox"/>
iii) Grains and food crops (maize, wheat, beans, sorghum, millet, Groundnuts etc.)	<input type="checkbox"/>
iv) Industrial crops (e.g. tea, coffee, cotton, tobacco)	<input type="checkbox"/>
v) Fruit and vegetable production	<input type="checkbox"/>
vi) Fodder, grazing/pasture or grass for animals	<input type="checkbox"/>
vii) Fish farming/aquaculture	<input type="checkbox"/>
viii) Other	<input type="checkbox"/>
4.2 Why do you grow farm produce or keep livestock for the household? (respond to all)	1=Yes, 2=No
i) As a main source of food for the household	<input type="checkbox"/>
ii) As the main source of income/earning a living	<input type="checkbox"/>
iii) As an extra source of income	<input type="checkbox"/>
iv) As an extra source of food for the household	<input type="checkbox"/>
v) For dowry for the household's male children	<input type="checkbox"/>
vi) As a leisure activity or hobby e.g. gardening	<input type="checkbox"/>

4.3 To whom does your household sell most of its produce?	[] []	01= Buyers from within or outside the district (Middle Men) 02= Formal markets/ Cooperative Societies 03= Export agencies in international buyers 96= other specify Other: _____
4.5 How did you acquire the land that you are currently using?	[] []	01= Purchased 02= Inherited or Received as gift 03= Leased 04= Do not know 96= Other (specify) Other:
4.6 What is the primary use of the land that you currently own?	[] []	01= Cultivated (annual crops) 02= Cultivated (perennial crops) 03= Rented-out 04=Fallow 05=Pasture 06=Grazing land 07=Woodlot/forest 96=Other (specify) Other:
Soil and water		
4.7 What soil type is in this land that you are currently using?	[] []	01= Sand 02- loam 03= clay 04= Black 96=Other (Specify) Other:
4.8 How do you rate the quality of soil you are currently using?	[]	1= Good 2= Fair 3= Poor
4.9 What is the main water source to this farm?	[]	1= Irrigated 2= Rain-fed 3= Swamp/ wetland
4.10 During the last completed season, were there any problems with erosion?	[]	1=Yes 2=No <i>If No, go to 4.14</i>
4.11 If Yes, what was the cause of these erosion problems?	[] []	01= Terrain 02= Flooding 03= Wind 04= Animals 05= Over Cultivation 96= Other (specify) Other:
4.12 Is there any erosion control?	[]	1=Yes 2=No <i>If No, go to 4.14</i>
4.13 If Yes, list two main erosion controls	[] []	1= Terraces 2= Gabions/ sandbags 3= Vetiver grass 4= Tree belts 5= None
4.14 Is there any water harvesting facility?	[]	1=Yes 2=No <i>If No, go to 4.16</i>
4.15 If Yes, list two main water harvesting facilities	[]	1= Water harvest bunds 2= Drainage ditches 3= Dam 4= Stone bunds 5= Earth bunds (pond)

	<input type="text"/>	6= None
Price fluctuations		
4.16 In the last 12 months, has this household experienced any crop price fluctuations?	<input type="text"/>	1=Yes 2=No <i>If No, go to 4.18</i>
4.17 If yes, to what extent did the price fluctuation affect your expected annual income?	<input type="text"/>	1= Very severely affected 2= Severely affected 3= Moderately affected 4= Not affected at all
4.18 In the last 12 months, has this household experienced any loss of the following assets due to landslides and/or floods?		
i) Crops	<input type="text"/>	1=Yes 2=No
ii) Livestock	<input type="text"/>	1=Yes 2=No
iii) House	<input type="text"/>	1=Yes 2=No
iv) Other assets	<input type="text"/>	1=Yes 2=No
Agricultural inputs		
4.19 What type of fertilizer do you use on your piece of land?	<input type="text"/>	1= only organic/manure 2= only Inorganic/chemical 3=Both organic and Inorganic 4=None
4.20 Where do you buy the fertilizers used?	<input type="text"/>	01= Government/ LC 02= Private trader in local market /village 03= Private trader in district market 04= Fellow farmer 05=Own livestock 06=Own crop 07= Neighbor/ Relative 96= Other (specify) Other:
4.21 Did you use any pesticides on the plot?	<input type="text"/>	1=Yes 2=No <i>If No, go to 4.23</i>
4.22 If yes, what type was used?	<input type="text"/>	01=Insecticides 02=Miticides/Acaricides 03= Fungicides 04= Growth regulators and harvest aids 05= Rodenticides 6=Nematicides/Molluscicides 96=Other (Specify) Other:
4.23 What type of seed did you use for on your plot	<input type="text"/>	1= Traditional 2= Improved
Post-harvesting handling		
4.24 In the last 2 seasons, have you experienced any loss of your crops after harvest?	<input type="text"/>	1=Yes 2=No <i>If No, go to 4.26</i>
4.25 If yes what was the reason for the loss?	<input type="text"/>	01= Insects 02= Rodents 03= Flood/landslides 04= Stolen 96=Other (specify) Other:
4.26 Did you do anything to protect the stored crop?	<input type="text"/>	1=Yes 2=No <i>If No, go to 4.28</i>
4.27 What did you do?		01= Spraying

	[] []	02= Smoking 96= Other (specify) Other:	
4.28 What is your main method of storage for crops?	[] []	01= Locally made traditional structure /Granaries 02= Improved locally made structure 03= Modern stores/ silos 04= Sacks/ open drum 05= Airtight drum 06= Unprotected pile 07= In ceiling of dwelling 96=Other (specify) Other:	
Extension services			
4.29 Did anyone in this household receive advice/information about agricultural/ livestock activities from any of the following sources in the past 12 months?			
Source	1=Yes, 2=No	Source	1=Yes, 2=No
i) National Agricultural Advisory Services (NAADS)	[]	v) Cooperative/farmer's association	[]
ii) District/sub county extension worker	[]	vi) Large scale farmer	[]
iii) Input supplier	[]	vii) Other (specify)	[]
iv) Ngo	[]	Other: _____	
<i>If No to all, go to 5.1</i>			
4.30 What was the advice about?	[]	1=Agricultural production 2=Agricultural prices 3=Agro-processing 4=Marketing 5=Fish production 6=Livestock production 7=Prevention of livestock diseases	
4.31 How would you rate the advice received?	[]	1= Good 2= Average 3= Bad	

PART 5: HEALTH DIMENSION			
5.1 During the past 30 days, did any member of this household suffer from any illness or injury?	[]	1=Yes 2=No	<i>If No, go to 5.7</i>
5.2 For how many days did the household member suffer due to illness or injury during the past 30 days?	[] []	days	
5.3 For how many days did the household member have to stop doing usual activities due to illness or injury during the past 30 days?	[] []	days	
5.4 Was anyone consulted for the major illness/injury during the past 30 days?	[]	1=Yes 2=No	<i>If No, go to 5.7</i>
5.5 If yes who was consulted	[]	1= Doctor 2= Nurse 3= Pharmacist 4= Traditional healer	
5.6 Where did the household member go for the first consultation during the past 30 days?	[] []	01= Government Facility 02= Outreach 03= Government Community Based Distributor 04= Private hospital Facility	

		05= Pharmacy/ drug shop 06=NGO Community Based distributor 07= Religious Institution 08= Traditional Healer 96= Other (specify) Other: _____	
5.7 What is the distance to the nearest health in km		[] [] . [] Km	
5.8 Time to reach the facility		[] [] [] Minutes	
5.9 Common transport means	[] []	01= Walking 02= Taxi (car) 03= Boda-boda 04= Bus/minibus 05= Motorcycle 06= Bicycle 07= Boat 96= Other (Specify) Other: _____	
5.10 What are the major concerns you have regarding access to health services in this area? (Record all that is mentioned)			
Concern	1=Yes, 2=No	Concern	1=Yes, 2=No
i) Long distance	[]	vi) Culture related issues	[]
vii) No means of transport available	[]	viii) Limited range of services	[]
ix) Open hours not convenient	[]	Viii) Poor quality services	[]
x) Long waiting time	[]	viii) Other (specify)	[]
xi) Medicines/supplies not available	[]	Other: _____	
Expensive/not affordable	[]		
5.11 Do you pay for health services (eg user fees, insurance)?		[]	1=Yes 2=No (it's free)
Water access			
5.12 What is the main source of drinking water	[] []	01=Protected well 02=Traditional, unprotected spring well 03=Boreholes 04=River sources 05=Tap/piped water 96=Others (specify) Other: _____	
5.13 How long does a return journey to the drinking water access point you use take, including time for waiting to get water?		[] [] []	minutes
5.14 Do you have to pay for drinking water?		[]	1=Yes 2=No (it's free)
5.15 Who is responsible for your source of drinking water?		[] []	01=None 02=Government 03=Private 04=Community 05=NGO 96=Others (Specify) Other: _____
Health insurance			
5.16 Does any member of this household have a health insurance coverage?		[]	1=Yes 2=No <i>If No, go to 5.19</i>
5.17 If yes, which type of insurance?		[]	1= Community Based Health Insurance 2= Public health insurance (RSSB, MMI) 3= Private health insurance
5.18 Who pays for your household's health insurance?		[] []	01= Household head or other relative(s) 02= NGO 03= Religious institution

		04= Government 05=Employer 96= Other, specify Other: _____
5.19 Have you lost any member of the household to any disasters?	[]	1=Yes 2=No <i>If No, go to 5.21</i>
5.20 If yes, how many members of this household have you lost to any disasters?	[] []	[] [] members
Toilet facility		
5.21 Which of the following types of toilet facilities are used in your household?	[]	1= Covered Latrine Private 2= Covered Latrine Shared 3= VIP Latrine Private 4= VIP Latrine Shared 5= Uncovered Pit Latrine 6= Flush Toilet Private 7= Flush Toilet Shared 8= Ecosan Toilet 9= No Toilet / Bush
5.22 Where is this toilet facility located?	[]	1=In dwelling 2=On site (in yard) 3=Off site (outside the yard)

PART 6: INFRASTRUCTURE DIMENSION		
6.1 What is the type of the nearest road/bridge?	[]	1= Tarmac 2= Marram 3= Feeder roads 4= Community roads 5= Bridges/culvert crossings
6.2 What is the current state of the roads/bridges?	[]	1=Good 2=Usable 3=Poor
6.3 In your opinion, what is the main reason for the poor roads?	[] []	01=Bad weather 02=Lack of equipment 03=Poor maintenance 04=Lack of engineers 96=Other Other: _____
6.4 How do you rate the quality of work for road maintenance?		1=Good 2=Average 3=Poor
6.5 What is the frequency of repairs for the roads/bridges?	[] []	01=Routine-manual 02=Routine-mechanized 03=Regular-manual 04=Regular-mechanized 96= Other (specify) Other: _____
6.6 What is the commonest mode of transport used to reach the nearest road?	[] []	01= Walking 02= Taxi (car) 03= Boda-boda 04= Bus/minibus 05= Motorcycle 06= Bicycle 07= Boat 96= Other (Specify) Other: _____
6.7 What is the distance (in km) from your household to the nearest public transport point/stage?	[] [] [] []	[] [] [] [] Km

6.8 How long does it take you to travel to the nearest road?		[] [] Minutes
Housing Conditions		
6.9 What type of dwelling do you live in?	[] []	01= Independent house 02= Tenement (Muzigo) 03= Independent flat/apartment 04= Sharing house/ flat/apartment 05= Boys quarters 06= Garage 07= Hut 08= Uniport 96= Other (specify) Other:
6.10 What is its tenure Status?	[] []	01= Owned, by Head 02= Owned, by Spouse 03= Owned, Jointly (Head and Spouse) 04= Rented (Normal) 05= Rented (subsidized) 06= Supplied free by employer 07 = Supplied free by relative or other person 08= Rent paid by relative or other person 96= Other (specify) Other:
6.11 What is the Major construction material of the roof?	[] []	01= Thatch, Straw 02= Mud 03= Wood, Planks 04= Iron sheets 05= Asbestos 06= Tiles 07= Tin 08= Concrete/Cement 96= Other (specify) Other:
6.12 What is the major construction material of the external wall?	[] []	01= Thatch, Straw 02= Mud and poles 03= Timber 04= Un-burnt bricks 05= Burnt bricks with mud 06= Burnt bricks with cement 07= Cement blocks 08= Stone 96= Other (specify) Other:
6.13 What is the major material of the floor?	[] []	01= Earth 02= Earth and cow dung 03=Cement 04= Mosaic or tiles 05= Bricks 06= Stone 07= Wood 96= Other (specify) Other:
Energy use		
6.14 Does this house have electricity?	[]	1=Yes 2=No <i>If No, go to 6.17</i>

6.15 If Yes, how many hours per day do you usually have power (electricity), in a season like this?		[] [] Hours per day			
6.16 How does the household pay for the electricity it uses?	[] []	01= Bill from power company 02= Provide in rent 03= Free use/illegal connections 04= Pay fee to neighbor 05= Operating cost of own generator 96= Other (specify) Other:			
6.17 Which stove is used most often by this household?	[] []	01= Electric 02= Gas 03= Kerosene 04= Wood / Sawdust Burning 05= Efficient Wood Burning/modern cook stoves 06= Charcoal 07= Other Biomass Burning 08= Open fire 96= Other (specify) Other:			
Governance					
6.18 To what extent do you feel that the decision of government in the district and sub-county reflect your own priorities?	[]	1=Never 2=Almost never 3=Only in some areas 4=Very much, to a large extent 5=Absolutely, always			
6.19 Do you agree with the following statement? "The local government cares about me and my opinions"	[]	1=Yes 2=No			
6.20 To what extent do you feel that the decision of those in central government in Kampala reflect your own priorities?	[]	1=Never 2=Almost never 3=Only in some areas 4=Very much, to a large extent 5=Absolutely, always			
6.21 During the past twelve months, has any government or public official asked YOU for the following in return for a service the official is legally required to perform?					
Money	[]	1=Yes 2=No			
A favor	[]	1=Yes 2=No			
A present	[]	1=Yes 2=No			
6.22 I am going to read out a list of services, please respond to each of the following questions					
Service	(a) Please tell me for each one if your household experienced a problem with it over the past year? 1=Yes 2=No	(b) Is there an official way to make a complaint? 1=Yes 2=No <i>If Yes, go to (c)</i> <i>If No, go to next row down</i>	(c) Did you report the problem? 1=Yes 2=No <i>If Yes, go to (d)</i> <i>If No, go to next row down</i>	(d) To whom did you make your complaint? 1=LC 2=The community 3=International agencies 4=Local NGO 5=Religious institutions	(e) Did the person you complained to help? 1=Yes 2=No
<i>A. Health</i>	[]	[]	[]	[]	[]

<i>B. Education</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>C. Water</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>D. Social assistance, such as pensions, aid given to the vulnerable.</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>E. Livelihood services, such as extension, seed distributions, training and help setting up credit funds.</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>F. Other (specify)</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other: _____					
6.23 What is your perception about corruption in this community?	<input type="text"/>	1= Severe 2= moderate 3= mild/low 4= none			
6.24 Who do you first run to for help during the event of a disaster?	<input type="text"/>	01= Family member 02= Neighbors/Community 03= Local NGOs 04= Religious institutions 05= Government institutions (ie Police) 96= Others (Specify) Other: _____			
6.25 How would you rank government support and response in the event of disasters?	<input type="text"/>	1= Very satisfied 2= Satisfied 3= Neutral 4= Dissatisfied 5= Very dissatisfied			
Land issues under governance					
6.26 Has this household ever been involved in any land wrangle?	<input type="text"/>	1=Yes 2=No			
6.27 Are land wrangles common in this community?	<input type="text"/>	1=Yes 2=No			
6.28 What are the common causes of these land wrangles?					
Cause	1=Yes, 2=No	Cause	1=Yes, 2=No		
i) Not locating boundaries for land after a disaster/conflict	<input type="text"/>	v) Eviction by government	<input type="text"/>		
ii) Land grabbing by outsiders	<input type="text"/>	v)Family related wrangles	<input type="text"/>		
iii) Eviction by cultural leaders	<input type="text"/>	Others: _____	<input type="text"/>		
6.29 How have these land wrangles being settled?	<input type="text"/>	01=Setting up community land committees 02= government Courts of law 03= Involving cultural leaders 04= Involving Elders 96= others (specify) Other: _____			

PART 7: HUMAN CAPITAL DIMENSION		
7.1a Are there cases of school dropouts in this household following the occurrence of any disasters?	[]	1=Yes 2=No <i>If No, go to 7.3</i>
7.1b If Yes, how many people in this household have dropped since the last occurrence of any disaster in this areas?	[][]	
7.2 If Yes, at what level did the last household member drop out?	[]	1= Primary Level 2= Secondary O' Level 3= Secondary A' Level 4= Tertiary Level
7.3 What is the other main reason for school dropouts in this community?	[][]	01= Too expensive 02= Too far away 03= Poor school quality 04= Had to help at home 05= Had to help with farm work 06= Had to help with family business 07= Education not useful 08= Parents did not want 09= Not willing to attend 10= Too young 11= Orphaned 12= Displaced 13= Disabled 14= Insecurity 96=Other Other: _____
7.4 What is the distance to the nearest primary school from this household?		[][][] . [] Km
Labour Force		
7.5 Does any member of this household contribute to any pension/ retirement fund (e.g. NSSF)?	[]	1=Yes 2=No
7.6 Is the household head having any formal employment?	[]	1=Yes 2=No <i>If No, go to 7.8</i>
7.7 If yes, what is the status of the employment?	[]	1=Permanent and pensionable 2=An open ended appointment 3=A fixed term contract
7.8 During the last 12 months, for how many months did the household head work in this current job?		[][][] months
7.9 Do members in this community have access to technical and vocational training institutions?	[]	1=Yes 2=No
7.10 Would you recommend any member of your household to attend any of the above training institutions	[]	1=Yes 2=No

PART 8: PSYCHOSOCIAL DIMENSION		
8.1 How would you rate your health at present?	[][]	01=Very good 02= Poor 03= Average 04= Good

		05= Excellent 88= Don't know
8.2 How satisfied are you with your life as a whole these days?	[] []	01= Very satisfied 02= Satisfied 03= Neither nor 04= Dissatisfied 05= Very dissatisfied 88= Don't know
8.3 In the last month, how often have you felt that you were unable to control the important things in your life?	[]	1=Never 2=Almost never 3=Sometimes 4=Fairly often 5=Very often
8.4 In the last month, how often have you felt confident about your ability to handle your personal problems?	[]	1=Never 2=Almost never 3=Sometimes 4=Fairly often 5=Very often
8.5 In the last month, how often have you felt that things were going your way?	[]	1=Never 2=Almost never 3=Sometimes 4=Fairly often 5=Very often
8.6 In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	[]	1=Never 2=Almost never 3=Sometimes 4=Fairly often 5=Very often
8.7 Do you usually see solution to problems and difficulties that other people find hopeless?	[]	1=Never 2=Almost never 3=Sometimes 4=Most of the time 5=Always
8.8 Do you usually feel that your daily life is a source of personal satisfaction?	[]	1=Never 2=Almost never 3=Sometimes 4=Most of the time 5=Always
8.9 Do you feel defeated by the stressors?	[]	1=Never 2=Almost never 3=Sometimes 4=Most of the time 5=Always
8.10 Which of the following statements best describes the extent to which you would say you or your household have been able to recover from the main stressor?	[]	1= Have not been able to recover 2= Recovered but now worse off and even feel more vulnerable 3= Recovered to pre-stressor level well-being and vulnerability 4= Recovered and better off and less vulnerable than before 5= We were not affected at all by the stressor
8.11 Have you adapted to living with the main stressor?	[]	1= Yes, definitely 2= Yes, mostly 3= I have adapted, but I also struggle 4= I struggle to adapt 5= No, not at all
8.12 Are you positive about life going forward?	[]	1=Never 2=Almost never 3=Sometimes 4=Most of the time 5=Always

8.13 Do you feel alone?		[]		1=Never 2=Almost never 3=Sometimes 4=Most of the time 5=Always	
Shocks and Stressors (Answer vertically)					
8.14 I am going to read out a list of shocks or problems or stressors, Please respond accordingly					
Stressor	(a)	(b)	(c)	(d)	(e)
	<p>Please tell me for each one if your household has experienced it in the past two years.</p> <p>1=Yes 2=No</p> <p><i>If No, go to next row</i></p> <p><i>If Yes, go to (b)</i></p>	<p>Please rank the top three with 1 as most significant stressor and 3 as least significant of the three</p> <p><i>Rank</i></p> <p><i>(1 - 3)</i></p>	<p>For each of the mentioned, how many times was it experienced?</p> <p><i>Go to (d)</i></p>	<p>How did your family deal with this?</p> <p>Read out options. <i>(Three responses possible)</i></p> <p>0=Did nothing 1=sale assets or use savings 2=Withdraw children from school 3=Leave home to look for work 4=Work in more casual labour 5=Borrowing money 6=Eat less/less preferred food 7=Cut back other expenditure 8= Eat seeds intended for planting 9=Relocate to other areas 96= Other (specify)</p>	<p>To whom did you turn for help?</p> <p>Read out options. <i>(Three responses possible. Record in order that they turned to them – first, second, third.)</i></p> <p>1=Friends and relatives 2=Clan elders 3=Local Councillors - 4=Church/faith community 5=NGOs 6=Government 7=Mutual solidarity groups 8=No one 96 Other (specify)</p> <p>_____</p>
i) Drought/Irregular Rains	[]	[]	[]	[] [] []	[] [] []
ii) Floods	[]	[]	[]	[] [] []	[] [] []
iii) Landslides/Erosion	[]	[]	[]	[] [] []	[] [] []
iv) High Level of Crop Pests & Disease	[]	[]	[]	[] [] []	[] [] []
v) High Level of Livestock Disease	[]	[]	[]	[] [] []	[] [] []
vi) High Costs of Agricultural Inputs	[]	[]	[]	[] [] []	[] [] []
vii) Low Prices for Agricultural Output	[]	[]	[]	[] [] []	[] [] []
viii) Fires	[]	[]	[]	[] [] []	[] [] []
ix) Loss of Employment of Previously Employed Household Member(s)	[]	[]	[]	[] [] []	[] [] []
x) Bad roads	[]	[]	[]	[] [] []	[] [] []
xi) Unemployment	[]	[]	[]	[] [] []	[] [] []
xii) Crime and Substance (Alcohol and	[]	[]	[]	[] [] []	[] [] []

Drug) Abuse					
xiii) Conflict/Violence	[]	[]	[] []	[] [] []	[] [] []
xiv) Thunderstorms/ lightening	[]	[]	[] []	[] [] []	[] [] []

THANK YOU