

INSTITUTIONAL SUPPORT FOR CLIMATE CHANGE ADAPTATION AND
COMMUNITY RESPONSES: THE CASE OF THE SIMALAHA PLAINS IN
ZAMBIA

BY

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DECLARATION

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ABSTRACT

Present-day research recognises the critical role played by local government institutions and NGOs at meso-level in supporting adaptation to climate change in rural areas. In Zambia, however, much attention is heavily focused on natural science and economic analyses studies on climate change, while little is known about how institutions closest to local communities support adaptation to emerging climate change challenges. This research presents findings from a qualitative and quantitative study conducted to investigate the role played by local level institutions at meso-level in supporting adaptation to climate change in the Simalaha area of the Southern and Western Zambia, and how communities respond to the support. It was found that public organisations primarily support soft climate change adaptation projects because they are cheaper to implement and do not attract huge budgetary allocations. Some of the supported adaptation and coping intervention projects include providing food hand-outs, new hybrid of crops, advice and training on the use of conservation farming. Financial investments supporting hard adaptation projects such as technological and infrastructural development are almost exclusively supported by donors through local NGOs, though they also support soft adaptation projects such as livestock production. Overall, the meso-level institutional support was equally distributed among all wealth categories – the poor, middle-poor and the non-poor. In principal, this means that poor people still get less because they lack personal alternative assets such as livestock to assist them cope in difficult situations. Although relevant as a coping intervention, when crops fail due to droughts, food hand-outs do not improve people’s adaptive capacities to handle future droughts. Benefits have been seen from the use of conservation farming when practiced properly. However, farmers perceive it to be excessively laborious and thus fail to practice it consistently. These results imply that there is greater need for government, local government institutions and NGOs at meso-level to support adaptation interventions that respond to all affected groups with an emphasis on the poor, if adaptation to climate change is to be enhanced.

Key words: Adaptation, Climate change, Meso-level institutions

*To my late father:
Bornface Mweemba,*

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LIST OF ACRONYMS

AIL	Adaptation, Institutions and Livelihood
ANOVA	Analysis of Variance
CBO	Community Based Organisation
CBNRM	Community Based Natural Resource Management
CBPP	Contagious Bovine Plural Pneumonia
CCRI	Climate Change and Rural Institutions Project
CMDRR	Community Managed Disaster Risk Reduction
CRAF	Climate Resilience Adaptation Facilitator
CSO	Central Statistical Office
DDMMC	District Disaster Management and Mitigation Committee
DFID	Department for International Development
DMMU	Disaster Management and Mitigation Unit
DREF	Disaster Risk Emergency Fund
DRR	Disaster Risk Reduction
EU	European Union
EWS	Early Warning Systems
FAO	Food and Agriculture Organisation
FGD	Focus Group Discussion
FRA	Food Reserve Agency
GRZ	Government of the Republic of Zambia
GWP	Global Water Partnership
HCT	Humanitarian Country Teams
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IIED	International Institute for Environment and Development
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute

JICA	Japan International Cooperation Agency
MEWD	Ministry of Water Development
MTENR	Ministry of Tourism, Environment and Natural Resources
NAPA	National Adaptation Programme of Action
NDMP	National Disaster Management Policy
NGO	Non-Governmental Organisation
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OFDA	Office of Foreign Disaster Assistance
PPCR	Pilot Programme for Climate Resilience
PUSH	Programme Urban Self Help
REDD	Reducing Emissions from Deforestation and Degradation
SARDC	Southern African Research and Documentation Centre
SDMC	Satellite Disaster Management Committee
SPCR	Strategic Programme for Climate Resilience
SPSS	Statistical Package for the Social Sciences
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children’s Fund
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development
WFP	World Food Programme
WMO	World Meteorological Organisation
ZARI	Zambia Agriculture Research Institute
ZNFU	Zambia National Farmers Union
ZRBI	Zambezi River Basin Initiative
ZRCS	Zambia Red Cross Society
ZVAC	Zambia Vulnerability Assessment Committee

CHAPTER 1

INTRODUCTION

1. Background

Since the early 1990s, the topic of climate change has emerged as one of the new agendas in many government policies across southern Africa. For instance, the climate change agenda is included in the National Policy on Climate Change of Zambia (Ministry of National Development Planning, 2016), the National Climate Change Policy of Malawi (Government of Malawi, 2012), the Botswana National Action Programme to Combat Desertification (Department of Environmental Affairs, 2006), and the National Policy on Disaster Management of Mozambique (Republic of Mozambique, 1999). By the term climate change is meant “the state of the climate that can be identified (i.e. using statistical tests) by changes in the mean and/or the variability of its properties and that persist for an extended period, typically decades or longer” (IPCC, 2012). Signs of climate change, according to Tompkins and Adger (2004), manifest themselves in four ways – gradual changes in mean temperatures and precipitation, greater range in seasonal and inter-annual variation, increased frequency and intensity of extreme events, and hasty changes in the climate causing disastrous changes in the ecosystems.

Zambia has not been spared from gradual changes in mean temperatures and precipitation, as well as hazards such as droughts and seasonal flush floods (ZVAC, 2009). This PhD research project, therefore, investigated various supports and interventions used by *meso-level institutions* to support adaptation to climate change adaptation. Generally, the term institution refers to established and prevalent social rules that structure social interaction (Hodson, 2006). In the context of this study, such interactions are devoted to supporting the promotion of a cause or program for the advancement of climate change adaptation (Pelling, 2011). Adaptation is the term used when people or ecosystems adjust to changes and variations observed in the climate (IPCC, 2012). Adaptation, in the specific context of climate change means adjusting to new sets of climate attributes, either new or unfamiliar from those already existing, or changed parameters of existing attributes (Schipper et al., 2010). This means that

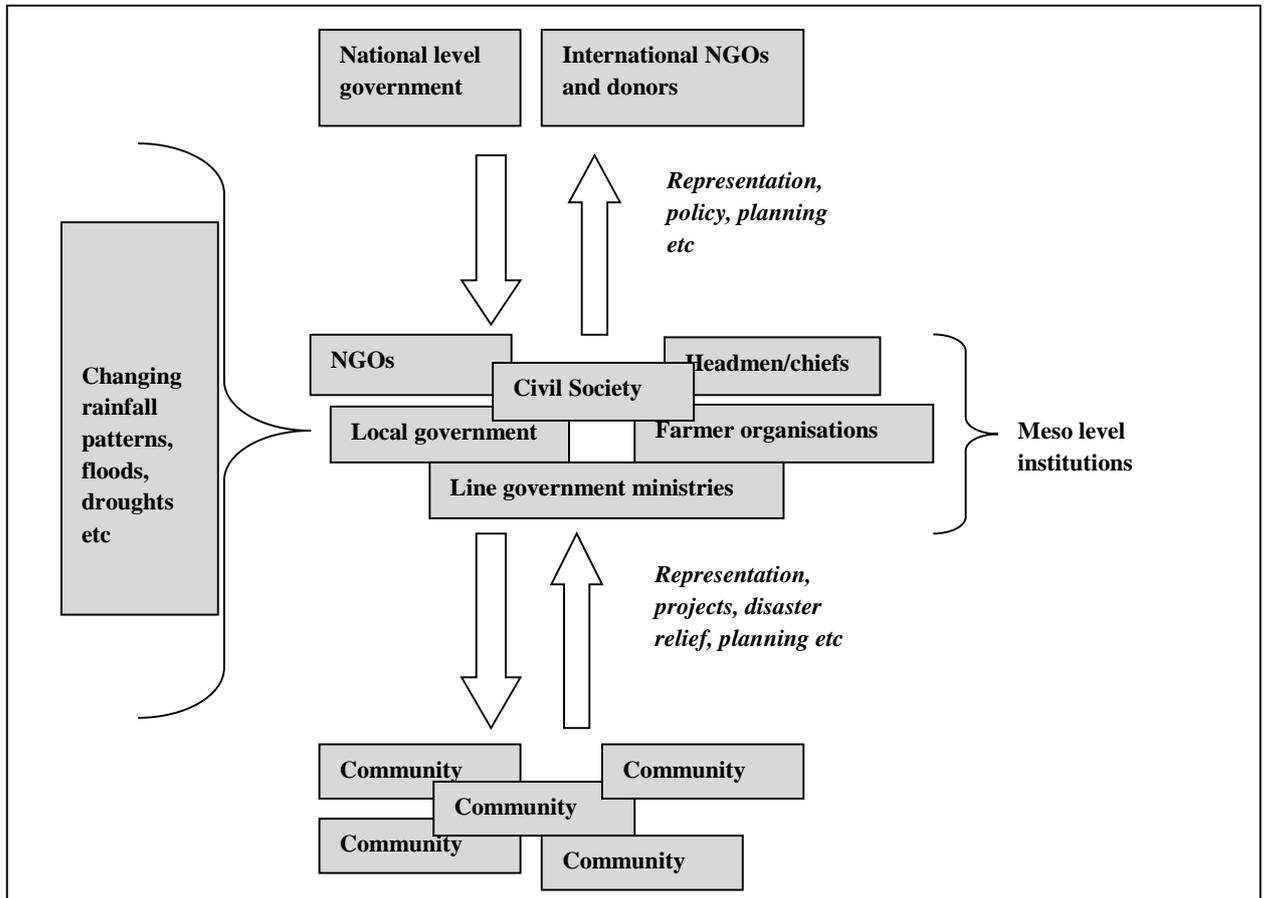
adaptation is about tackling the effects of climate change, mainly through increasing the resilience and capacity to cope with its physical impacts (Adger et al., 2007; Prowse and Scott, 2008). Adaptation also refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change (Smit et al., 2001).

At community level, various authors (e.g. FAO, 2004; Hodson, 2006; Schipper et al., 2010; Chettri et al., 2012) recognise meso-level institutional support to climate change adaptation as an important means to sustainable community adaptation. This level of institutions can be looked at as *shorthand* for institutions resulting from sub-state dispersal of power (Ortbals et al., 2011) i.e. between the national and community levels. These may include rules of conduct and different roles of actors that bring about desirable government arrangements of transparency and accountability (Cleverly, 2012). In this study's specific context, the term *meso-level institution* refers to district level organisations (specifically local government, agricultural extension services, agencies involved in natural resource management and farmer organisations) responsible for providing an enabling environment for climate change adaptation (Peters et al., 2012). Sometimes, meso-level institutions can be equated to district level formal or informal organisations that mediate between communities and national or international organisations. Such mediation may involve performing varied functions such as information gathering and dissemination, resource mobilization and allocation, skills development, as well as mediating and interacting with decision makers on behalf of local people as illustrated in Figure 1-1.

Recognition of the important role played by meso-level institutions is due not only to their proximity to localised climatic hazards and, thus, best suited to enhance appropriate climate change adaptation strategies in rural areas. It is also because meso-level institutions are in contact with different social groups that would enable them gain access to and use different assets and resources allocated to them (Agrawal, 2008). Yet still, some scholars recognise that proximity to local hazards is not enough in itself to enhance local adaptation because this can be hampered by other factors such as lack of financial

resources for implementation and inadequate decentralised management policies in support of response strategies (see Faguet, 2003).

Figure 1-1: Illustration of meso-level institutions in research specific context



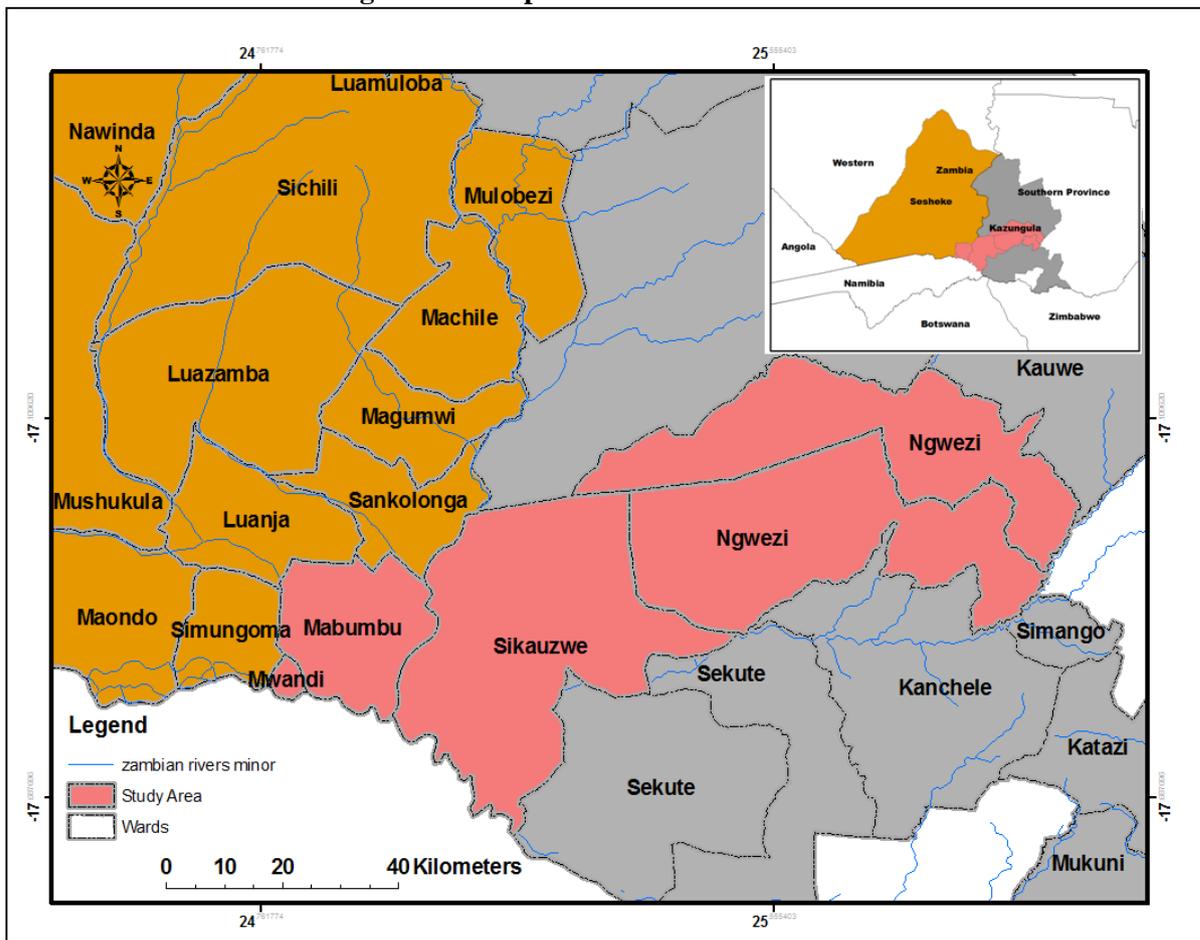
Source: Climate Change and Rural Institutions (CCRI) Project Workshops, (2012).

In addition, supporting various social groups to access various assets and resources is only effective when communities for which the interventions are intended are receptive to such strategies and policies and, also that the interventions actually address people's needs. Therefore, the far-reaching implications of successfully executing a climate change adaptation programme requires a sophisticated set of approaches from meso-level institutions that are appreciated by communities for a positive response.

This PhD project has contextualised and investigated social perspectives of climate change, focusing on floods, droughts and changing rainfall patterns (gradual changes) in and around the areas of the Simalaha Plains that the adaptation efforts are responding to. The Simalaha Plains are situated in the Southern and Western provinces of Zambia, adjoining Kazungula and Sesheke districts, respectively (Figure 1-2). The plains and its surrounding areas were selected as research sites for this study because they fall in agro-Ecological Region 1 which is most prone to droughts hence most vulnerable to climate change impacts. This means that the area presents a rich case to investigate.

Some areas in the plains and surrounding areas had also previously been reported to have had recurrent hazards in form of extreme floods and droughts in same or intermittent years (IFRC, 2010). Moreover, gradual changes in form of reduced rainfall patterns had also been reported in the same areas (Thurlow et al., 2009).

Figure 1-2: Map of the Simalaha area



The Simalaha area have also been earmarked by government and several NGOs for various interventions of climate change adaptation following climatic hazards such as droughts and floods that impacted on general livelihood (Disaster Management and Mitigation Unit (DMMU), 2008; Ministry of Finance, 2013).

1.1 Statement of the Problem

For the last three to four decades, the Simalaha area has been experiencing climatic hazards (Zambia Vulnerability and Assessment Committee (ZVAC), 2009). The most prominent of these hazards have been droughts, seasonal and flush floods, extreme temperatures and dry spells (ZVAC, 2009). In the last two decades, however, extreme flooding of the Zambezi and its tributaries has increased (Mwape, 2009). This is also true for most parts of the sites located in proximity to the Zambezi River as reported in the media and policy documents¹. The resultant impacts have been displacement of communities, particularly those in the Sikaunzwe and Ngwezi wards, destruction of crops, disruption of accessibility to schools and health centres, outbreaks of infectious plants, and damage to infrastructure (including water sources) (Mwape, 2009; ZVAC, 2008). Dry spells and droughts have also characterised the biophysical nature of the Simalaha area causing major crop failure, thus limiting food securities in the area (ZVAC, 2008; Thurlow et al., 2009).

The problems symptomatic to climate change, such as displacement of communities and food insecurities, have been reported in the Simalaha area (e.g. IFRC, 2010; IUCN, 2009; Mwape, 2009; ZVAC, 2009; SARDC 2010). This research thus, investigated what measures were used by meso-level institutions in and around the areas of the Simalaha

¹ For donor and media articles linking floods and climate change, see e.g.

- Guardian (2009) Devastation in Zambia as climate change brings early flooding. July 6, 2009. <http://www.guardian.co.uk/environment/2009/jul/06/zambia-flood-climate-change>
- Global Times (2010) Zambia's floods are human-induced. April 16, 2010. <http://www.globaltimes.cn/world/africa/2010-04/523146.html>
- DFID (2009) Raising the red flag on climate change in Zambia. Dec. 15, 2009. <http://www.dfid.gov.uk/Stories/Case-Studies/2009/Zambia-and-crop-surveys/>
- Oxfam (no date) Zambia's extended flooding season. No date. <http://www.oxfam.org/en/campaigns/climatechange/zambia-coping-with-climate-change>
- UNICEF (no date) Unite 4 Climate Zambia. No date. http://www.unicef.org/zambia/5109_8464.html

Plains of Kazungula and Sesheke districts to enhance adaptation to stated problems of climate change, and how communities responded to such adaptation interventions.

Moreover, there were insufficient evidence-based studies to show what approaches were used by meso-level institutions to recommend appropriate climate change adaptation measures in rural areas of Zambia and globally. Further, the extent to which communities responded to such adaptive measures in the selected study area was still indefinite.

1.2 Study Objectives

The overall objective of the research was to investigate what measures are used by meso-level institutions in enhancing adaptation to climate change in the Simalaha area of Kazungula and Sesheke Districts of Zambia and how communities respond to the interventions.

More specifically, the study's objectives were:

1. To investigate local people's existing climate change adaptation strategies.
2. To examine how and to what extent meso-level institutions support adaptation to climate change in the study area;
3. To investigate who benefited from the meso-level institutional adaptation interventions in the study area; and
4. To investigate how communities respond to adaptation interventions supported by meso-level institutions.

1.3 Research Questions

1. What are local people's climate change adaptation practices?
2. Are there local level (meso-level) institutional systems to assist in enhancing adaptation to climate change?
3. Which are these and how have they worked/operated to enhance adaptation to climate change?
4. Who benefits from the meso-level institutional adaptation interventions at community level?

5. How have the communities responded to adaptation interventions supported by meso-level institutions?

1.4 Significance of the Study

Like most people who live in Zambia's Agro-ecological Region 1², people in the Simalaha area have felt impacts of crop failure resulting from droughts (including those of 1991/1992, 1994/1995 and 2004/2005 farming seasons) and floods (e.g. those of 1998, 2001, 2004, 2007 and 2009)³, (Thurlow et al., 2009, Kasali., 2008). While policy documents, such as the Strategic Programme for Climate Resilience (SPCR) and the National Disaster Management Policy (NDMP) lay down measures on how to manage and adapt to climatic hazards (Government of the Republic of Zambia, 2011; DMMU, 2005), little is known of the extent to which meso-level institutions contribute to making such measures a reality at community level. Indeed, literature in Zambia, showing what roles organisations closest to areas most affected by climatic hazards play is less robust, hence justification for this study. Documents on the importance of organisations in enhancing adaptation to climate change have been published by various authors elsewhere in the world, including Agrawal (2008), Boko et al., (2007), Easterling et al., (2007); Thynne (2008), Schipper et al., (2010), and Rodima-Taylor et al., (2012), showing evidence of institutional support in other locations, but Zambia. Some of these documents show the important role played by local organisations to climate change adaptation, in general terms. Such kind of strong analysis of different responsibilities upheld by different local level practitioners in climate change adaptation is still lacking in the Zambian context. This research is, therefore, intended to provide empirical evidence of the measures recommended and used by local level organisations in Zambia to enhance adaptation to climate change, as well as the social dynamics compelling local level organisations to respond when faced with climate change related challenges. Further, the research provides evidence on the extent to which such measures are taken on by rural communities and implications thereof.

² Agro-ecological Regions are land resource mapping units, defined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use (FAO, 1996).

³ EMdat website – <http://www.emdat.be/result-country-profile> This data source is also used in Zambia's draft National Climate Change Response Strategy (GRZ, 2011)

Moreover, many studies on climate change in Zambia have been heavily centred on evidences from natural sciences and economic analyses (see: Jain, 2007; Thurlow et al., 2009; Maantay and Becker, 2012) with little attention paid to the social dimensions of climate change. This research is important in offering the social perspectives of climate change adaptation and how the involvement and contributions of meso-level institutions enhances adaptation or its lack of, at local level.

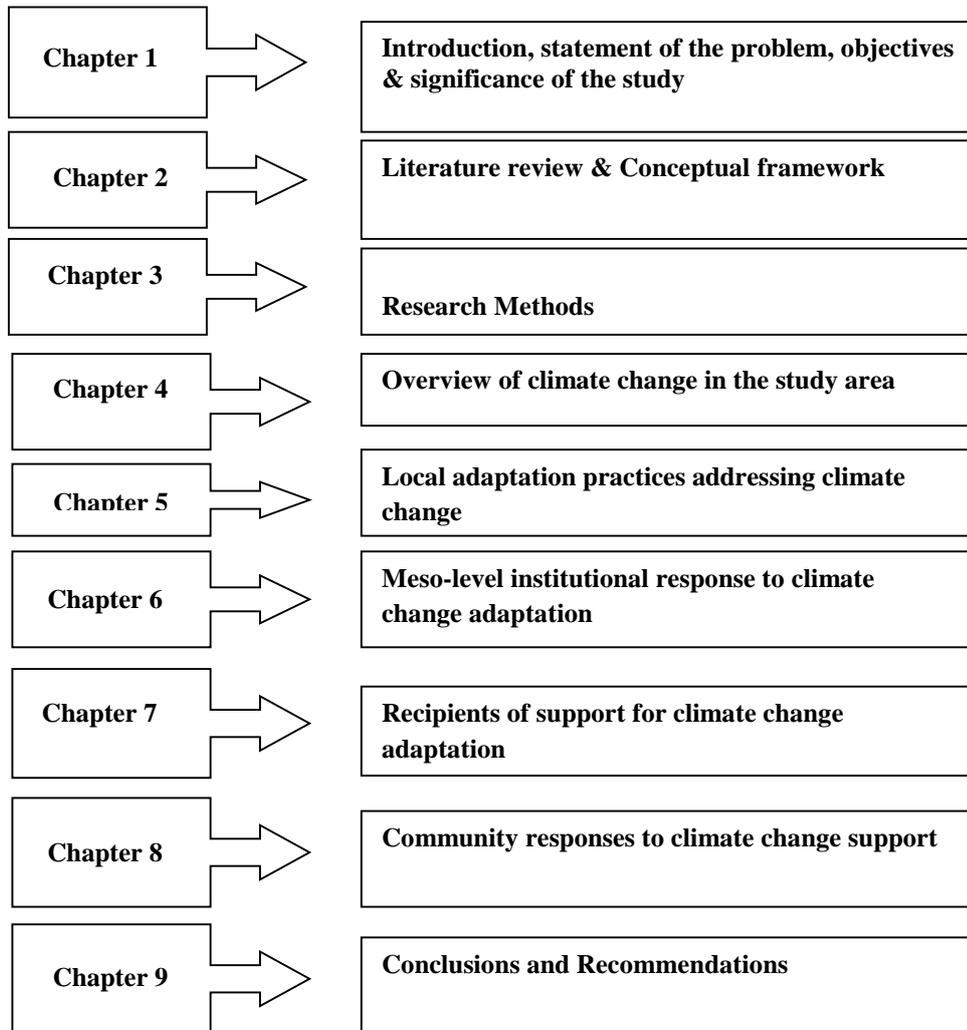
Furthermore, past research on climate change adaptation has focused on adaptation measures at household level (Acquah, 2011; O'Donnell, 2011; and Nyanga, 2012), and recommendations have been made at higher levels i.e. national and international levels (World Resources Institute, 2011; United Nations Secretary-General's High-level Panel on Global Sustainability, 2012). The most important meso-level organisations that act as a linkage between higher decision-makers and practitioners on one hand and local households and individuals have been side-lined. With growing trends in increases of droughts and flood frequencies, there is urgent need to explore sub-national roles, responses and practices used to boost adaptation to climatic hazards through relevant policy formulation and implementation. This study is thus important in addressing the knowledge gap that currently exists about the role meso-level institutions play in providing an enabling environment for climate change adaptation through enhancing best adaptive local practices.

1.5 Scope of Work

This thesis has been subdivided into different chapters. In addition to the abstract and preliminary sections, nine (9) Chapters constitute this thesis (Figure 1-3). Chapter 1 covers the introduction, highlighting objectives of the study and significance of carrying out the research. Chapter 2 discusses the literature review and provides the analytical framework on institutional support to local climate change adaptation and implications of such support on community adaptation strategies. Chapter 3 and 4 brings to light the research methods and an overview of climate change in the study area, respectively. Chapter 5 describes existing community adaptation practices addressing climate change impacts. Chapter 6 and 7 shows the existing meso-level institutional support to climate change adaptation and, who actually received the support for climate change adaptation,

respectively. Chapter 8 investigates how communities respond to climate change interventions and projects. Lastly, Chapter 9 discusses the conclusions and recommendations of the study (Figure 1-3).

Figure 1-3: Structure of the thesis



CHAPTER 2

LITERATURE REVIEW AND ANALYTICAL FRAMEWORK

2. Introduction

The first part of this chapter examines existing literature on climate change adaptation as well as community adaptation practices. The literature review recognises the scientific understanding of climate change and engages social perspectives of climate change as understood in the Simalaha area. Additionally, the literature reviews the roles played by meso-level institutions in relation to climate change adaptation and how they enhance or lessen local adaptation to climate change.

The second part of the chapter describes the analytical framework used for understanding the interactions and measures used by meso-level institutions in enhancing local adaptation to climate change and how such measures fit into community adaptation strategies.

2.1 Literature Review

In order to conduct the analysis, it is important to understand the concepts of climate change adaptation, hazards and risks and local institutions. In the following, the researcher will discuss the concept of climate change adaptation because of its economic and social costs. The literature shows that effects of climate change are impacting on general livelihood, biodiversity and global economies (e.g. see Kandji et al., 2006; Adger et al., 2007; OECD, 2009; Boko et al., 2007; Easterling et al., 2007). The Least Developed Countries, such as Malawi, Mozambique, Zambia and Zimbabwe, in these arguments, are said to be the ones to bare the most consequences of climate change if nothing is done about it (see Kandji et al., 2006; Adger et al., 2007; OECD, 2009). This is because their economies (i.e. agriculture and natural resources) are highly dependent on the climate (Ader et al., 2007; Boko et al., 2007; Easterling et al., 2007). For instance, the fourth Global Environmental Outlook Report of the United Nations Environment Programme (UNEP) (2007) showed that, of the 3.2 billion people affected by climate disasters in the 21st Century, 80 percent of them were from poor countries (UNEP, 2007).

Other arguments put across suggest that with climate change, the limited financial and human resources, especially in developing countries will continue to experience pressure whereas a reverse on the gains of development will occur, if no corrective measures are put in place (Madzwamuse, 2010). At the core of these arguments, adaptation emerges as a key component to counter experienced and emerging impacts of climate change.

Alongside adaptation measures and corrective initiatives is the involvement and support of *relevant* actors. These can be institutional or organisational actors, in any country; at local, national or international level i.e. governments and NGOs. These are significant in enhancing climate change adaptation and most recently, a new phenomenon has been developed to look at intermediate local level organisations' involvement in climate change adaptation (see Agrawal, 2008).

2.1.1 Climate Change and Adaptation

As already alluded to, “climate change is the state of the climate that can be identified (i.e. using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer”, (IPCC, 2001). Signs of climate change, therefore, include gradual changes in mean temperatures and precipitation, greater range in seasonal and inter-annual variation, increased frequency and intensity of extreme events, and changes in the ecosystems (Tompkins and Adger, 2004 cited in Agrawal, 2008). The UNFCCC also defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. This definition, the UNFCCC notes, makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes. The newer definition of climate change, as defined by the IPCC, encompasses causes such as natural processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2011).

Contemporary scholars have argued that growing concerns of climate change impacts require dynamic efforts for economies and societies to become accustomed to the

changes (see Goklany, 1995; Smit et al., 2001; Agrawala and Cane, 2002; Adger et al., 2007; Schipper, 2009; Madzwamuse, 2010). When adjusting to changes and variations observed in the climate, *adaptation* is the term used. Adaptation, in the specific context of climate change means, adjusting to a set of climate attributes, either new or unfamiliar from those already existing, or changed parameters of existing attributes (Schipper et. al, 2010), implying that adaptation is about tackling the effects of climate change, mainly through increasing the resilience and capacity to cope with its physical impacts (Adger et al., 2007; Prowse and Scott, 2008). Adaptation also refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change (Smit et. al, 2001). Coping capacity on the other hand is “the means by which people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster. (In general, this involves managing resources, both in normal times, as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards) (UN/ISDR, 2004).

In today’s debates, the researcher notes that most climate change discourses suggest that adaptation is a necessity that should be tackled with as a matter of urgency. This is because (i) currently, impacts are already felt and delayed responses will create future unavoidable challenges in the natural occurrences of systems (Adger et al., 2007; Agrawal, 2008; Prowse and Scott, 2008), and (ii) discernible initiatives of lessening impacts of climate change have been slow and insufficient, making adaptation more necessary (Prowse and Scott, 2008). This means that there is urgent need to deal with climate change and variation today, than in future.

Indeed, this research is partly grounded on propositions made by Adger et al. (2007), Agrawal (2008), and Prowse and Scott (2008) that climate change is already impacting livelihoods and economies, in general. As alluded to in the preceding sections, the Simalaha area of Kazungula and Sesheke Districts, for instance, has been experiencing recurrent drought and flood conditions resulting from changes in the precipitation pattern (Jain 2007; MTENR, 2007; Thurlow et al., 2009; Neubert et al., 2011). The 2005/2006 rainy season, for example, was characterised by severe flooding which disrupted the

social order in the Zambezi Basin by causing damage to crops, schools, telecommunications and roads while in some places, villages in their entirety were flooded, requiring complete relocation of people and livestock to drier lands (Chagutah, 2006; ZVAC, 2007; ZVAC, 2009). Such adverse impacts on general livelihoods required that people and general systems become accustomed to the changes and advance options that are conducive in such circumstances in order to survive. Given this scenario, the act of becoming accustomed to these changes best fits the definition of adaptation, hence significant for further investigation in this study.

On the other hand, championing adaptation as proposed by Goklany (1995), Smit et al., (2001), Agrawala and Cane (2002), Adger et al., (2007), Schipper (2009), Madzwamuse (2010) will only lessen climate change challenges of current and future generations if it is not used in the place of strengthening policies and regulatory frameworks that support eradication of the causes of climate change. Climate change today is mainly driven by human activities and interference on the ecosystem and the environment (Canadell and Mooney, 2002). Due to increased growth in human population, consumption and exploitation of the earth's resources have caused significant changes in the ecosystem. For instance, continued land-use changes such as depletion of natural vegetation to create crop-lands and emission of greenhouse gases consequently increase world temperatures (IPCC, 2013). Deforestation prevents trees from trapping and keeping sufficient carbon within their leaves and thus most of it ends up in the atmosphere creating unbalanced atmospheric conditions. The result is a higher concentration of greenhouse gases in the atmosphere, which in turn has a heat-trapping effect (the greenhouse effect). According to the IPCC (2013), this leads to warming and other climatic changes, including less rainfall.

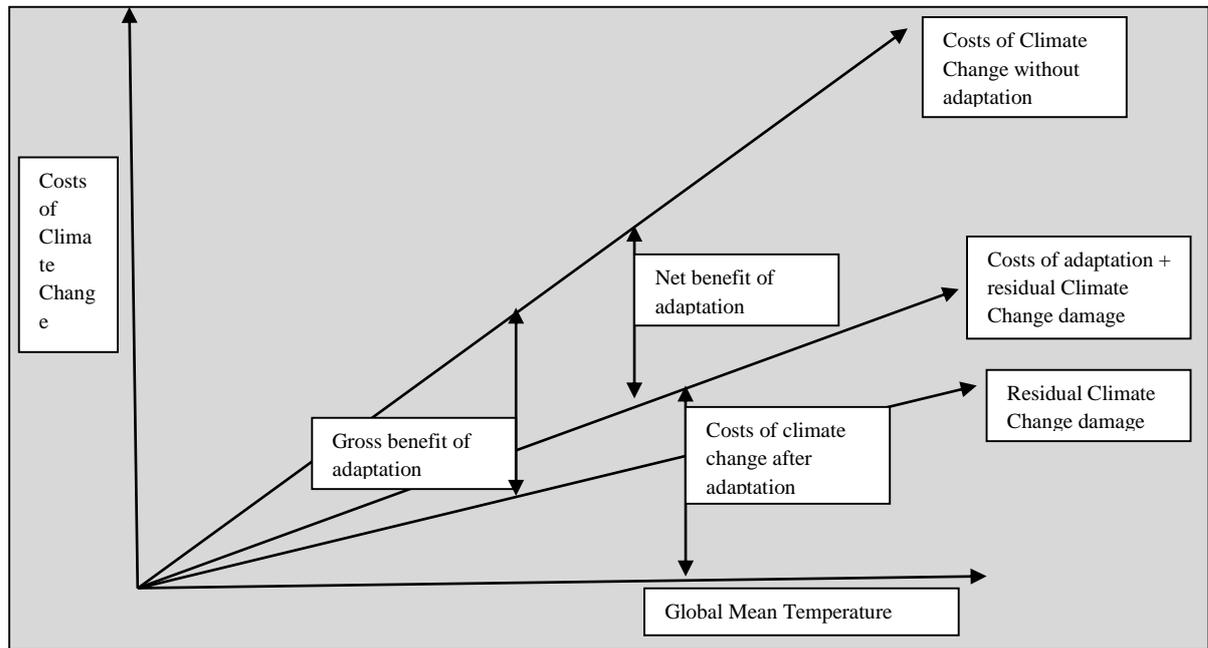
In the same vein, literature such as IPCC (2013) observe similar aspects such as weather patterns, as no longer occurring as natural phenomena, thus limiting responses to adaptation. Without a deliberate policy of dealing with the root cause of climate change promises more harm to future generations than current generations can conceive. The occurrence of seasonal weather patterns, are seen occurring as one would expect, but are driven and have been tampered with by human activity (Adger et. al, 2009). Obviously,

this is as observed, that human activity is the cause of the escalating levels of greenhouse gases in the atmosphere (Lamboll et. al, 2011). This is recognised as the cause for global warming, responsible for changes in the typical weather scenarios. Based on the Intergovernmental Panel on Climate Change (IPCC)'s findings of climate change, 'warming of the climate system is indisputable, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level' and 'Most of the observed increase in anthropogenic greenhouse gases concentrations' (IPCC, 2013). Consequently, implications of climate change occurrences and its ultimate implications will offer advantageous outcomes for certain groups or individuals, at the time of occurrence or in future while impacting negatively on other people and sectors of other economies.

2.1.2 Adaptation as a Means to Reduce the Costs of Climate Change Impacts

Adaptation is also cardinal for lessened climate change costs as illustrated in Agrawal's Stylized Relationship between Costs of Adaptation and Climate Change (Figure 2-1). Agrawal observes that impacts of climate change i.e. gradual temperature increases and reduced rainfall patterns, without intervention of any sort, exacerbate to great extents than when adaptation measures are put in place. Decadal warming rates of 0.29° C in the African tropical forests (Malhi and Wright, 2004; Boko et al., 2007) and 0.1 to 0.3 in South Africa (Kruger and Shongwe, 2004; Boko et al., 2007) had been observed, and mechanisms to counter the impacts of temperature increases were not adequately documented and implemented by most African governments. Agrawal's (2008) framework also acknowledges that, in addition to increased unavoidable marginal costs of climate change impacts, delays in responding to climate change will in future require enhanced efforts and capacities for effective adaptation.

Figure 2-1: Stylized Relationship between Costs of Adaptation and Climate Change



Source: Agrawal, 2008

Adaptation to climate change lessens vulnerabilities and risks of communities and economies in areas such as Southern Zambia and parts of Western Zambia with periodic annual drought episodes (Jain, 2007; Neubert et al., 2011). These areas heavily depend on rain-fed agriculture, and thus face the burden of crop failure, food insecurities and limited income generation in years of severe drought or dry spells. Improvising water harvesting and storage technologies in years of rain surplus for such communities would lessen the disruption of their social order and promises sustainability and positive development. Similarly, diversification in crop production and growing crops of early maturing varieties promises sustained food securities in areas like Sesheke District, faced with constant rainfall variability and shortages. Agrawal's (2008) observations, which suggests that impacts of climate change exacerbate without adaptation measures are thus valuable for this research because they form the basis for understanding the important role adaptation plays in economic and social development.

As observed from arguments made by various authors, mentioned in the preceding sections (e.g. Smit et al., (2001), Agrawala and Cane (2002), Adger et al., (2007),

Schipper (2009), the topic of adaptation is a key issue in climate change debates. Adaptation has also been widely recognised as one of the means for dealing with new challenges of climate change and variability and also improving well-being of societies and economies in general. However, the literature is inadequate in dealing with social and cultural connotations on the extent to which adaptation works on the people it is intended. Firstly, different approaches and perceptions of what works in adaptation can limit how people interpret and respond to climate change adaptation. Depending on prevailing conditions, preferences of adaptation and advocated for measures may be conflicting to contextual situations, beliefs and values. For instance, conservation agriculture, an approach that has widely been advocated for as a means of promoting sustainable land management and promises moisture retention for increased crop productivity (see Kandji et al., 2006; Marongwe et al., 2011) has equally been widely promoted in Kazungula and Sesheke Districts, including other Zambian rural communities where drought conditions are prominent (Arslan et. al., 2013). The concept has shown commendable results where it has been accepted and applied properly, like the Eastern Province (Arslan et. al., 2013). Yet, being a new concept of changing farming techniques from e.g. the conventional farming methods with oxen to non-mechanised systems of using hand hoes in digging planting basins, it is seen to be excessively labourious by rural communities. Moreover, sustainable yield increases are only realised in the long term (Swennenhuis, 2012). This has challenged receptiveness of the conservation type of technology. In addition, empirical evidence of promoting conservation agriculture in Zambezi heartlands of Kazungula, and other parts of the Southern Province, showed low continuity of the system following the withdrawal of direct agricultural support to farmers (Swennenhuis, 2012) due to its labourious nature and low acceptance levels (Arslan et. al., 2013).

When people and governments take up adaptation measures, varied considerations of risks and challenges of not getting accustomed are taken into account. For instance, different measures and initiatives, such as use of conservation farming in agriculture have been undertaken within and across sectors, the world over. Yet, such measures have not been found to be universally or equally available (Rayner and Malone, 1998, cited in Smit et. al, 2001). Major calls for adaptation are seen in technological advancements and

good guiding principles to reduce the magnitude of climate change impacts (Schipper, 2009). Others opt for change in locations when faced with hazards, though, this ultimately depends on the availability of resources and conditions in potential destination areas (McGregor, 1993; Smit et. al, 2001). In Kazungula District, for instance, the study by (Mwape, 2009) reported of the flood victims relocating from flood prone areas to drier lands, with an inclusion of start up support of food and infrastructure.

Moreover, some evidence points to adopting new foodstuffs grown and consumed and seeking reparation for damages encountered when climate pose hazards (Adger et. al, 2009). Obviously, other modes are used as evidenced from research in some parts of Southern and Western Zambia (see Mwape, 2009; Kalantary, 2010; Lwando, 2013), where people diversify in crop production, making furrows and increase reliance on natural resources during crop failure and declining fish stocks.

Additionally, while a wide range of options are available for climate change adaptation, different levels and contextual settings i.e. global, national and local will have differentiated types of adaptation. At global level, the most talked about types of adaptation are international cooperation where nations, industrialised and developing, alike, work together in awareness creation of climate change and issues of adaptation by aligning to global and local priorities in improving policy and science interactions (Wang'ati, 1996; Gupta and Hisschemoller, 1997; Smit et. al, 2001). Other focus brought about by development partners are highlighted in the Poverty and Climate Change of 2003, by the Multi Agency Report and the Declaration on Integrating Climate Change Adaptation into Development Cooperation, which identifies the importance of 'significant coordination and sharing of good practices on integrating climate change adaptation into development cooperation' (Madzwamuse, 2010). Further commitment to adaptation is reflected in the recent established funds of three adaptation funds (Richards, 2003; Madzwamuse, 2009; Madzwamuse, 2010). At national level, adaptation is more inclined to developing suitable national policies and plans in sectors with high vulnerability to the climate (Mustafa, 1998; Smit et. al, 2001). The majority of countries in Southern Africa, Zambia inclusive, have devised national Early Warning Systems

(EWS) to monitor their climate in relation to crop production in subsequent years (Kandji et al., 2006).

At local and individual levels, adaptation options include identification and prioritisation of local adaptation options and provision of feedback to higher levels of government (Ahmed et al, 1999) and are as observed by Kalantary (2010), where reliance on natural resources increases. Growing debates also look at what communities do collectively or individually when faced with floods or droughts, for instance (see Nyadawa et al., 2010).

Observations made by various scholars are valuable to this research. They not only structure the understanding of how climate change adaptation measures interact at different levels, but also offer opportunities for generation of new information on what could work in the face of climate change challenges. However, while global talks on adaptation as indicated by Wang'ati, (1996), Gupta and Hisschemoller (1997), Smit et al., (2001) of aligning worldwide and local priorities to improving policy and science interactions have been glorified in climate change adaptation, the general principles and applications of worldwide policies is not something that could be achieved easily. Developed and developing countries have different priorities in growth and development and policy outcomes are normally tailored to context specific situations. Many countries in Africa (such as Zambia, Lesotho, Malawi, Gambia, Liberia and Tanzania) and Asia (such as Nepal, Yemen, Bangladesh, Afghanistan, and Bhutan), have developed the National Adaptation Programmes of Actions (NAPAs) to identify priority activities that respond to critical and immediate needs to adapt to climate change. These are of course country specific. In the event that the NAPAs advocate for lesser extraction of raw materials for export to developed nations, for better adaptation to local situations, conflictive or unfavourable circumstances may arise because of financial implications and economic growth implications of putting a ban to the export of raw materials – which are a major input to industrial use in most developed countries. Similarly, the much talked of greenhouse gas emissions have been a source of controversial talks in climate change discourses⁴, even though, it has been identified as a major contributor to temperature increases and hazardous to the atmosphere. Much cognisance in cooperation and

⁴Post-Kyoto protocol on greenhouse gas emissions; and the Copenhagen Climate change accord

development agreements is therefore, required to address priorities that cut across various interests in improving adaptation to climate change both locally and internationally.

According to contemporary scholars, several major classifications of adaptation are identified based on their attributes of purpose, timing, agents and temporal scope (Carter et al., 1994; Stakhiv, 1994; Bijlsma et al., 1996; Smithers and Smit, 1997; UNEP, 1998; Leary, 1999; Bryant et al., 2000 cited in Smit et al., 2001). Purposeful adaptation can either be autonomous or planned. By definition, *autonomous adaptation* is that which does not constitute a conscious response to stimuli, but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. It is also referred to as spontaneous adaptation (Olmos, 2001) whereas *planned adaptation* is the result of deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return, maintain, or achieve a desired state (Pittock and Jones, 2001; Malik et al., 2010).

Acknowledgment of adaptation types made by various scholars is significant for this research, because it shapes recognitions that with climate change occurrence, a counter response of adaptation is achievable whether planned or autonomous. For instance, the changing varieties of farming crops, from cassava to rice growing, in the flood plains of Sesheke and Kazungula areas experiencing recurrent flooding would be an example of autonomous responses used to suit new climatic conditions. Similarly, diversifying income by growing drought resistant livestock like goats and the wider use of technologies to ‘harvest’ water, conserve soil moisture (e.g., crop residue retention) and to use water more effectively in areas with rainfall decreases (see Aggarwal and Mall, 2002; Alexandrov et al., 2002; Tubiello et al., 2002; Adams et al., 2003; Easterling et al., 2003; Howden et al., 2003; Howden and Jones, 2004; Butt et al., 2005; Travasso et al., 2006; Challinor et al., 2007), are examples of autonomous adaptation that also show experiences from the Zambian context. However, today’s climate change adaptation advocates, support the use of *planned anticipatory adaptation* as opposed to *autonomous adaptation*, due to its potential in reducing vulnerability on livelihoods and economies and realise opportunities associated with climate change (Smit et. al, 2001).

This study, like Smit et al (2001), supports advocating for planned adaptation as opposed to autonomous adaptation due to its influence on planning and implementation of policy decisions that are intended through proper considerations of outcomes. This is because planned adaptation has potential to improve receptiveness on the people it is intended and greatly lessens impending impacts, even though it's recommendations comes from different sectors i.e. government, NGOs and Civil Society. Moreover, planned adaptation has significantly received recognition over the years; as the best mode, as opposed to the autonomous type, due to increased awareness of detrimental impacts humans pose on the environment which they ultimately depend for survival, if their adaptation is not of conscious decision. Without conscious environmental protection, humans stand vulnerable to several climate hazards, including loss of general livelihood and plummeting of the economic systems, especially in developing countries.

In conclusion, while improving adaptive capacities of current generations, there should be additional cognitive recognitions of climate change adaptation interventions that not only focus on issues at face value but wider considerations of environmental concerns that will minimise challenges of future generations. This has implications of how the creation of adaptation options will meet the requirements of those whom they are designed to serve and, therefore, sustainable in the long run.

2.1.3 Hazards, Vulnerabilities and Risks

Research pieces of evidence on climate change and variability point to climate change as the major cause of many hazards facing nations today (see Riché, 2007; Evans and Steven, 2009; Mwape, 2009; Tembo, 2011). Most often, research findings and media reports are made of extreme weather events such as flooding in different parts of the worlds, with devastating impacts on people's well-being (see Stal, 2011; Mare, 2011). In Mozambique, extreme flooding of the Limpompo River affected south of the country in the 2000s and the extreme flooding of the Zambezi River that affected the central region during 2001, 2007 and 2008 was said to be responsible for destruction of crop outputs and goods worth huge sums of money and left a great deal of people homeless (Stal, 2011). In the Southern African regions, such events have been reported extensively, particularly in Namibia, Malawi and Zambia, due to significant increases in heavy

rainfall events (Usman and Reason, 2004; Boko et al, 2007) causing an influence on inter-annual water level fluctuations and water unpredictability, and thus making the regions vulnerable to flooding. In addition, pieces of evidence of changes in seasonality and weather extremes (Tadross et. al, 2005; New et al., 2006) have also been reported as contributors to regional vulnerabilities.

Vulnerability is, therefore, used to describe sensitivities of individuals or systems to specific hazards, and sometimes described as sensitivity and exposure (Schipper et al., 2010). By definition, vulnerability is conceptualized as the degree to which a system is susceptible to, or experiences environmental or socio-economic stress, assessed by the magnitude, frequency and duration of exposure to climate variability and its adaptive capacity (Olmos 2001). Adger et al., (2007) define vulnerability in the context of climate change, as the tendency of human and ecological systems to suffer harm and their inability to respond to stresses imposed as a result of climate change effects. Further, several factors have been advanced as determinants to vulnerability, including geographical location, gender, age, political affiliation, livelihood, access to resources and entitlements, in which the most important element purport that the hazard does not translate directly to risk but that it is qualified by the degree of vulnerability of the individual or system in question to the hazard (Schipper et al., 2010).

In these definitions, stressors and hazards are portrayed as occurring naturally and control measures cannot thus be put forehand to prevent them from occurring. However, abilities or inabilities of people or societies to respond to stressors or hazards will be different because there are different social factors involved that are a cause for people's vulnerability and also factors that will enhance or lower their levels of adaptive capacities (Wisner et al., 2003; Agrawal, 2008). Vulnerability is generated by social, economic and political systems that influence how hazards affect people in varying ways and with different intensities (Wisner et al., 2003; Adger et al., 2007, Agrawal, 2008).

Indeed, assertions made by Wisner et al., (2003), and Adger et al., (2007) regarding levels of development of the systems and their social and economic factors, such as distribution of resources and political contexts being influencers of peoples' abilities or inabilities to

respond to hazards, are important observations in relation to this research. They structure understanding of why different people and societies will deal with stressors differently and be affected differently by same hazards, despite each and every one possessing inherent abilities to deal with certain climate variations. In the context of Zambia, farming communities, especially in rural areas, suffer from food shortages and loss of assets when droughts and floods occur. However, there are differences on the extent to which different social groups and individuals will suffer loss and their abilities to cope from famine or any other stress situations caused by floods. For instance, households without alternative forms of livelihood, such as formal employment, are most likely to feel the brunt of the effects of floods because they generally lack important social safety nets such as alternative financial resources to support their families when crops are destroyed in a flood. Taking away their basic source of livelihood leaves them more vulnerable than groups and individuals with alternative sources of livelihood such as rural teachers and nurses within the same communities because other than farming activities, the latter groups are able to support their families from their formal employment incomes. This research will therefore build on the understanding of the important role played by alternative income opportunities in improving adaptive capacities for local livelihoods in the study communities.

Further, sentiments of the importance of alternative livelihood opportunities are equally discussed in Mwape's (2009) study conducted in the Sikaunzwe area of the Simalaha Plains. The study established that the majority of the people in Sikaunzwe (accounting for 90%) heavily depended on crop production with no alternative livelihood opportunities. From the sampled households, 5% and 4% of the people engaged in trading and fishing, respectively, as alternative forms of livelihoods. With recurrent flood incidences in the area, high dependence on crop production puts communities at a very vulnerable position in case of crop failure because there are no alternative incomes to fall back on. To avoid excessive impacts of flood in times of excessive flooding, a wide range of livelihood options, such as crop diversification and relocating to higher grounds, have to be advocated for to improve livelihood opportunities for the people.

Still, it is important to note that there are instances when many people and societies will suffer equally and be at similar levels of risk and vulnerabilities, despite their strong social and political backgrounds, because a lot of factors come into play, depending on the form of disaster occurrence. For instance, people with high social and economic standing and those with low levels of well-being, inhabiting same areas are all at risk of exposure to drowning in the event of flood occurrences especially when such events occur during their sleep. In light of this, the media and district documents⁵ reported of assets and livestock being wiped out belonging to all people in the Simalaha Plains of Kazungula and Sesheke Districts, irrespective of their social standing. In such instances, when hazardous events are not planned for, there is not much one can do to be at lesser risk of exposure than the next person. Likewise, “*social safety nets*” are not a determinant factor to help people from harm or sometimes death because exposure to such events would affect everyone at the same time and be equally felt, whether rich or poor.

In view of the above, however, most literature still suggests poor nations, as opposed to developed countries to having low adaptive capacities, thus are the most vulnerable to climate change and variability (Boko et al., 2007; Ribot, 2012). Arguments point to the high reliance of their economic sectors such as agriculture and forestry on the climate. In the event of rainfall shortages or droughts or the depletion of natural resource base, such are not capable of responding effectively when faced with climate change because their source of survival gets severely stressed. A similar scenario is likened to poor people. This is because the poor are less capable of defending themselves against many forms of stress (Ribot, 2012). They often occupy environments that are generally prone to droughts and floods, lack insurance to recover from losses, and have little influence to demand that their governments provide protective infrastructure, temporary relief, or reconstruction support (Ribot, 2012).

There is a high consensus within the literature that poor nations are most vulnerable to climate change because of their economic orientation of being dependant on the climate. To a large extent, such assertions are seen to be valid because they represent pertaining

⁵ See Disaster report on floods (Kazungula District Administration, 18th February, 2008); Kazungula District Disaster Management and Mitigation Committee Report (2008)

situations in the context of Zambia. Zambia's economy is characterised of a dual economy that heavily depends on minerals and agriculture without a large diversification in economic activities. Crop failures or depletion of mineral resources, including unfavourable markets lowers the performance of the economy and ultimately makes the Country more vulnerable in the event of hazards, because its capabilities of responding effectively to hazards is low.

Other than the assertions made above, Ribot (2012) recognises that with better infrastructure, policy and planning, mediating the relationship between climate trends or events and outcomes, vulnerability and exposure to climate risk is greatly reduced – though this reduction in vulnerability is most prominent in developed nations. Drawing on the works of Frank and Husain (1971) and CEDMHA (2007), Ribot (2012) observes that Cyclone Bhola of 1970 and Cyclone Gorky of 1991 that hit Bangladesh, leaving 500 000 and 140,000 people dead, respectively, were of lesser intensity than the 2007 Cyclone Sidr, yet only 3,406 people died. The reduction of the deaths and damage resulting from Cyclone Sidr were attributed to Bangladesh's shift from a focus on disaster relief and recovery to hazard identification, community preparedness, and integrated response efforts. Indeed, this demonstrates an effective climate action against disasters (Ribot, 2012).

Of course, proactive actions against disasters yield positive outcomes and greatly reduce the vulnerabilities of the people. But to say such actions are most prominent in developed nations, whilst developing nations lag behind, is not entirely accurate. Prior to the introduction of the Disaster Risk Reduction (DRR) programme in Zambia, challenges of flooding on the people of the Zambezi Basin were severer to an extent that floods disrupted peoples' livelihoods year after year. With the introduction of DRR programme, the region has focused on introducing alternative forms of livelihoods, such as bee keeping activities and rearing small livestock (such as goats) less sensitive to bad weather conditions, to avoid complete vulnerabilities and risk of food insecurities when faced with floods or droughts. In addition, droughts and floods are no longer seen only in a negative way because they can now be used to grow crops that can withstand less water, such as cassava, or too much water, such as rice, respectively. Excessive flood water can

also be harvested for use during dry years and accumulated nutrients residues used for soil fertilization.

In conclusion, climate change has been seen to increase people's vulnerability, as well as that of economies if limited attention is awarded to it. Yet, some scholars hold that glorifying climate change at the expense of other potentially catastrophic situations to its social order is an error. However, the latter view has only been sourced solitarily. Therefore, the extent to which the notion holds among various authors and such information captured and represented in the literature is yet to be ascertained.

2.1.4 The Role of Local Institutions in Climate Change Adaptation

There has been a growing debate among contemporary scholars that local institutional support to local climate change adaptation, should take the centre stage (Smit et al., 2001; Agrawal, 2008; Thynne, 2008). This is because of their close proximity to local hazards and awareness of first hand local challenges. Agrawal (2008) argues that, in the event of hazards in communities, local institutions facilitate external support of resources in local climate change adaptation, by tailoring mobilised resources and new technologies from external sources to climate affected areas. He observes that institutions, within their profound functions of capacity building, providing leadership and mediating between externalities and communities will affect how adaptation outcomes are ultimately accepted and used by local people.

Certainly, Agrawal's assertions are of value to this research because they structure the foundation for the better understanding of the critical role played by institutions on the ground in local climate change adaptation. In well-functioning organisations grounded on principles of integrity, positive results have been noted among communities supported by such organisations when adapting to changing climate and variations (FAO, 2004). On the flipside of things, however, while this is the case, there are cases when the extent to which such mediatory actions have not been effective, especially in developing countries, due to unforeseen actions by some actors. Inadequate operational funds for local level functioning of organisations would require that alternative funds are sourced to operate effectively. When resources mobilised for local climate change support are

available, such resources tend to support the creation of new processes within organisations, and operational and maintenance costs, rather than supporting local communities in climate change adaptation, thus limiting the actual support to its intended people. In situations like these; finances are tailored towards unintended purposes and trust vested in institutional support is lessened and the confidence that institutions are an important vehicles that channel societal outcomes in the face of climate change is perceived as a misleading notion for the people affected.

Moreover, proximity to local hazards and knowledge of climate change causes, impacts and possible solutions does not necessarily lead to enhanced adaptation (Adger et al., 2007). Scholarly evidence on risk, cognitive and behavioural psychology points to inadequacy of the ‘deficit model’ of public understanding of science (Adger et al., 2007). This model assumes that providing individuals with scientifically sound information will result in information assimilation, increased knowledge, action and support for policies (Adger et al., 2007), yet individual’s interpretation of information is mediated by personal and societal values, priorities, personal experiences and contextual factors (Irwin and Wynne, 1996; Adger et al., 2007).

Furthermore, local level institutions have had challenges with implementing climate change projects, even with the availability of required funds, due to gaps in capacity and human resources (see Faguet, 2003). For instance, the climate change agricultural and food security project, funded by the United National Development Programme (UNDP) in the Western and Southern Zambia failed to kick start until more than half time into the project timeframe because of inadequate human resources on the ground to implement planned activities. Political interference in the implementation process also plays a part in putting such activities on track. This implies that appropriate knowledge of local challenges and hazards; including mediating resources to the lowest levels do not always enhance adaptive capacities of the people, as generally assumed.

Other arguments supporting local institutions as important means for improving local adaptation maintain that, countries with well-developed social institutions have greater adaptive capacity than those with less effective institutional arrangements (Smit et. al,

2001). The role of policy with support from implementing institutions has also been said to have potential to reduce the vulnerability of people and infrastructure through provision of risk information for private and public investments (Haddad et al., 2003; Callaway, 2004; Haddad, 2005; Tompkins and Adger, 2004).

However, evidence on the ground is not always in line with guiding principles used to reduce on risk factors of climate change because they are sometimes not always in line with issues being advocated for. For instance, even though institutional arrangements exist to reduce challenges brought about by climate change, Bangladesh is vulnerable to climate change particularly in areas of food production, settlements and human life, because existing institutional arrangements are not sufficient in their leadership to ease the hardship for the people (Smit et al., 2001). This has consequently constrained adaptive capacities of the people in the agriculture sector and adapting newer methods that would ideally reduce their vulnerability to climate change impacts. In addition, local institutions function within the limits of guiding principles. Most local level donor supported climate change adaptation projects have policy guidelines through which implementing officials must follow. Of course, this is meant to ensure that there is less mismanagement of funds and reducing aspects of diverting resources to unplanned activities. However, this has been known to be the cause of failure in most developing countries. Stipulated guidelines on what the funds should support are not always in line with local contexts. The fertilizer support programme, for instance, has been a failure in some parts of Zambia where it was implemented because the national policy of fertilizer distribution continues to be applied as a countrywide policy, including in places where fertilizer does not yield positive outcomes on crop production. Whilst fertilizer application shows good yield in the Southern Province and other areas *along the line of rail*, people of the Western Province with soil orientations that are characterised with sandy formation see it as a waste to apply fertilizer because it gets washed away at the onset of the rains. Fertilizer has also been said to be one of the causes for further soil degradation to their already poor soils. What is seen to be relevant is soil development using stock manure. But because there usually is no consideration of local contexts prior to implementation of such measures, the government just uses uniform interventions that are sometimes not beneficial to the intended users. As a consequence, recipients of the

fertilizer support programme will upon receiving the fertilizer inputs, resale it to people *along the line of rail* who by far have correct use for the product.

In conclusion, when placing emphasis on roles played by institutions to support local climate change, certain aspects of local contexts should be taken into account. Firstly, there should be understanding of the extent to which such support aligns with local needs and societal beliefs to improve on levels of receptiveness; and secondly, the use of countrywide policies and guiding principles to advance certain measures should be avoided. Instead, analysis of context specific situations should be taken into consideration to advance correct measures for the people such measures are intended.

2.1.5 Engaging Institutional Theory in Climate Change Adaptation

As already alluded to in the preceding sections, institutions play a vital role in adaptation to climate change (Smit et al., 2001; Agrawal, 2008; Thynne, 2008) because they have the ability to constrain or enable human behaviours (Hodgson, 2006) and societal outcomes (Agrawal, 2008). However, whilst this understanding is widely acknowledged, there is no general consensus as to what an institution really is (Davis, 2010). There is no clear-cut definition that befits all schools of thought in the understanding of institutions. North (1991), a scholar from the Mainstream Institutionalism⁶ school of thought, has defined institutions as humanly formulated constraints that structure political, economic and social interaction consisting of both formal and informal rules to govern behaviour. A similar definition was provided by Araral (2009) who defined institutions as “the working rules of going concern”, where he observed that institutions are rules of the game that constrain or provide opportunities, reduce uncertainties and thus, determine the incentive to structure everyday life.

In both these definitions, institutions are seen as rules of conduct created to shape social and individual expectations, interactions, and behaviour (Agrawal, 2008). Arguments suggest that with the existence of designed rules to govern social outcomes, it is expected

⁶ Mainstream Institutionalism scholars consider the role of institutions as a system that should provide information and assurances about the behaviour of people, to offer incentives to behave in a collective good, and to monitor and sanction opportunistic behaviour (Cleaver, 2012).

that society will be held together, giving it sense and purpose (Smit et al., 2001). Ostrom (1999), further points out in her study of ‘designing principles of managing commons’, that in institutions premised on common-pool resources, there are collective-choice arrangements where some principles devise good rules based on the understanding of local contexts and since people interact with one another in the socio-ecological contexts, there is high likelihood that the interaction will yield desired rules over time to suit specific characteristics of contextual settings.

While Ostroms’ (1999) theory may hold in some circumstances, it is an overstatement to assume that the existence of good rules will produce desired outcomes. First of all, local traditional institutions often are devoid of codified, written rules especially in rural Africa, including the Simalaha area of Zambia. Secondly, human interaction in socio-ecological contexts is challenged by so many factors that may limit such outcomes to be seen. For example, if good principles of conduct, specific to local contexts in the framework of climate change adaptation were applicable for all social beings, the current situation of differences in adaptive capacities by different people would not have been a major concern presently. Ideally, it would imply that devising workable solutions for all people in a similar location would entail that they respond in a similar manner that positively brings certain desirable outcomes for all. But reality is not always uniform; there are differences in adaptive capacities based on individual differences and cognitive interpretation of rules governing social conduct. The latter view is therefore important, in structuring adaptation against the background of continuously advocating for not uniform principles, but those that improve understanding of people’s interpretation of what would work for their specific adaptation in responding to climatic change, through support from governments or institutions at local level.

With this background, the understanding of institutions as proposed by Cleaver (2012), in her two broad categories of schools of thought further highlight merits and inadequacies in each and shows which school of thought best fits the study context.

On one hand, there are scholars from the Mainstream Institutional school of thought (North, 1990; Ostrom, 1990) and on the other hand are the scholars from the Critical

Institutional school of thought (Agrawal, 2005; Cleaver, 2012) grounded in the understanding of social theory, history and ethnography to give an alternative way of thinking, not necessarily about institutions but the collective management of natural resources (Cleaver, 2012). The Mainstream Institutionalism school of thought considers the role of institutions as a system that should provide information and assurances about the behaviour of people, to offer incentives to behave in a collective good, and to monitor and sanction opportunistic behaviour (Cleaver, 2012). The Critical Institutionalism school of thought on the other hand considers that regarding principles on face value and assuming that people act for the common good may be misleading, without understanding how socio-ecological systems come to play, as well as considerations of historical, traditional, formal and informal arrangements at play (Mosse, 1997; Cleaver, 2001; Lund, 2006 in Cleaver; 2012).

Of significance, in the two categories of the schools of thought are the differences with which institutions are professed. While the mainstream institutionalists purport that created institutions can be formalised, showing clear boundaries of resource use, as well as having inclusive decision making (Blaikie, 2006; Ostrom, 2009), the critical institutionalists on the other hand point out that there are no clear outcomes of institutional processes irrespective of how well-crafted the rules governing them are (Cleaver, 2012). This is because there is always interaction between the natural and social perspectives and the latter views' effects are not always predefined, neither can their outcome be known. Moreover, the rules of conduct do not necessarily structure practical outcomes but are institutionalised through practice and knowledge of what holds in practice and making provisions, and adaptation of previous practice (Cleaver, 2012).

Contextualising the two broad schools of thought into this study, we note that the critical institutionalism is more relevant in understanding why despite formal arrangements, rules and regulations governing behaviour and practice being in existence, challenges exist with implementation on the ground. For instance, formalised work and processes of NGOs and local government in enhancing adaptation to climate change are adhered to, based on preconditions set forth in which actors are expected to function. However, the set preconditions and rules governing implementation alone are insufficient to

enhance adaptation to climate change for the people it is intended. Issues of non-receptiveness of advocated for measures, technical know-how and incentives and hijacking of resources and processes by influential people, for instance, may limit realisation of intended outcomes. In Cleaver's (2012) analysis of factors shaping human behaviour in institutions and general outcomes, this provides a clear example of institutional bricolage of how in addition to formal rules and regulations, there are informal rules, social beings and power dynamics that shape outcomes and human behaviour in institutions. As present day scholars, this consideration is cardinal and realistic because so many factors have potential for influencing the outcome of a single process that should be looked at from many different angles before coming up with a single conclusion.

Further, other scholars have viewed institutions as systems that structure societal outcomes through various support and interventions (Hodson, 2006; Schipper et al., 2010; Chettri et al., 2012). More often than not, responsibilities and actions of various actors in institutions at local level have tended to change towards reducing the burden of people faced with climate hazards and change. These actions, however, may require that certain new measures are put in place not common to the everyday status quo of institutional practice. For instance, instead of institutionalised systems of producing and announcing weekly bulletins on weather predictions on local radio stations, to prepare farmers for the farming season, additional systems may be devised such as engaging local people to physically deliver such messages on the ground to improve on efficiency and adoption (UNDP, 2013). However, these measures are not meant to replace the existing order but merely additional measures perceived to be of utmost relevance to the prevailing situations. This kind of incremental change is what Kathleen Thelen terms as institutional layering or gradual institutional change (see Thelen, 1999; Thelen, 2003; Thelen 2004). Similar arguments regarding gradual institutional changes are discussed by Mahoney and Thelen (2010) and Streeck and Thelen (2005). Major arguments in these analyses focus on how institutions challenged with environmental, political or social situations will transform successively towards achieving a foreseen objective, rather than distorting their usual existence. In climate change contexts, institutions have tended to

come up with innovative ideas that are suitable for prevailing local conditions to ensure continuity and sustainability of livelihoods for the local people (Ragasa et al., 2013).

For instance, the agriculture sector has strived to improve technological innovation to advance adaptive capacities for local farmers, and rural communities facing environmental challenges (FAO-Adapt, 2013). The Zambian context is not new to this phenomenon. Several meso-level institutions have included to their official duties, extra measures of improving community adaptation (see Makano, 2011; UNDP, 2013). New measures, for instance, are put in place to improve on the provision of early warning mechanisms during floods to lessen impacts of potential floods within the wider framework of disaster risk reduction (UNDP, 2013). The new structures, however, are not meant to displace the existing structures in responding to hazards, but work to enforce response strategies.

Whilst gradual changes of institutionalised practices may be used to explain and understand how institutions change with the emergency of new ideas and norms, it is not always clear to identify the point of departure at which such measures can be considered infused in the institutional set up or seen as mere minor activities responding to issues of the moment (Van der Heijden, 2011). The introduction of small livestock i.e. goats, for instance, in the livestock restocking programmes in Kazungula and Sesheke districts was one measure introduced based on the idea that goats as opposed to cattle were better placed in areas of increased dry spells and drought conditions (Erasmus et al., 2012). Despite continued shortages of rainfall, it was professed that communities would still have a continued source of better livelihood selling goats to earn incomes when their crops failed as a result of droughts. Of course, if applied and implemented well, such measures promise improved adaptation for local communities. However, it cannot be ascertained the extent to which such measures may be considered as gradual institutional changes or mere momentary responses to challenges facing communities of the day.

In conclusion, theoretical perspectives of institutions brought forward have highlighted that there is no one way of looking at institutions in today's environment because a single system is affected by several processes that may not be clear on face value. What is

important in this study is to show clearly that while rules and regulations exist to give clarity on how systems should function, it is important not to allow the processes not be overshadowed by the existing rules and regulations. Knowledge of other socio-ecological factors that influence the outcome of processes should be considered, even when working towards advancing appropriate climate change adaptation strategies.

2.2 Analytical Framework

In climate change adaptation, institutions have an important role to play. They have been observed to influence how local people respond to environmental changes and challenges, and also mediate on how external support to climate change adaptation are taken on by local communities (Agrawal, 2008).

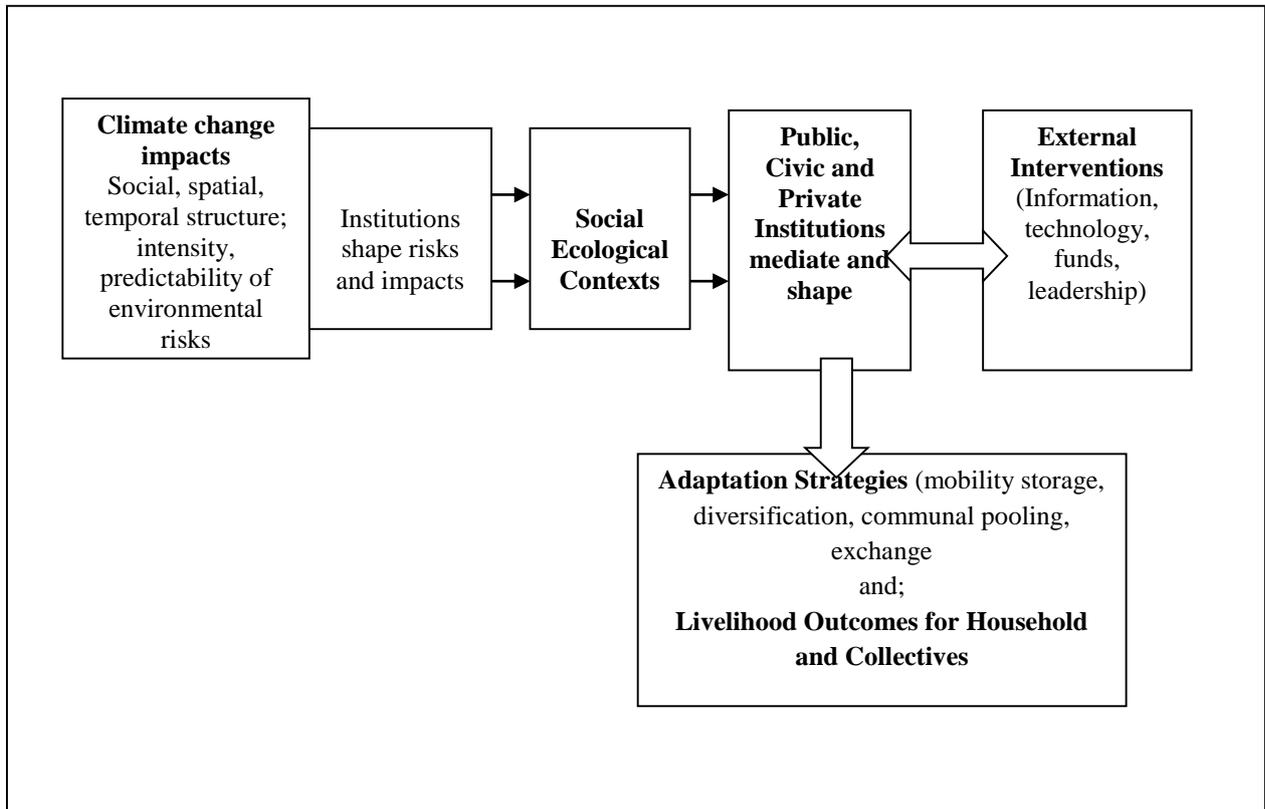
In the preceding sections, different institutional perspectives have been shown and this section will show how institutions are used in this research and their importance in advancing appropriate climate change adaptation measures.

2.2.1 Contextualising the Role of Institutions in Climate Change Adaptation

This research emphasises the role of local institutions in climate change adaptation. In this research, institutions are viewed partly as the rules of conduct that constrain or provide opportunities, reduce uncertainties and determine the incentive to structure everyday life (Araral, 2009), but also as organisations (particularly local government, agricultural advisory services, agencies involved in natural resource management and farmer organisations) working with communities to structure climate change adaptation outcomes (Peters et al., 2012). The latter view is what forms the bigger framework of this study. The need for studying the involvement of institutions as organisations comes in play not only due to their *proximity* to local contexts, but also their understanding of local circumstances triggering changes locally. Therefore, understanding of institutions as organisations is important in contextualising the role of local organisations in climate change adaptation in the study area. This is achieved by understanding how actors and institutions closest to climatic hazards fair in local climate change adaptation. This

phenomenon is partly explained using Agrawal’s (2008) framework of Adaptation, Institutions and Livelihood (AIL) (Figure 2-2).

Figure 2-2: Adaptations, Institutions and Livelihood Framework



Source: Agrawal, 2008

The AIL framework illustrates how institutions potentially determine livelihood outcomes and how households in a social ecological context will be affected by climate risks. Agrawal (2008) identifies three different ways of structuring livelihood outcomes. Firstly, he argues that institutions structure outcomes of environmental risks and variability. This implies that in the face of climate change impacts, such as droughts or floods, households and communities with unlimited access to institutional support are likely to suffer lesser effects of the negative impacts posed by hazards. This, however, can only be achieved when institutions provide necessary information on how to overcome impacts of climate change, for instance, as well as making available technologies, social amenities and financial resources that can assist facilitate adaptation interventions to potentially reduce the risk to climate change impacts.

Secondly, Agrawal (2008) argues that institutions create the incentive framework within which outcomes of individual and collective actions unfold. This entails that adaptation practices and livelihood outcomes are essentially driven by institutional norms and concerted efforts of actors' recommendation and directives. For example, the extent to which individuals and/or communities diversify in drought resistant agro products draws a lot of influence from advice of extension workers in agriculture as well as local NGOs advancing such measures seen to be best suited to local contexts.

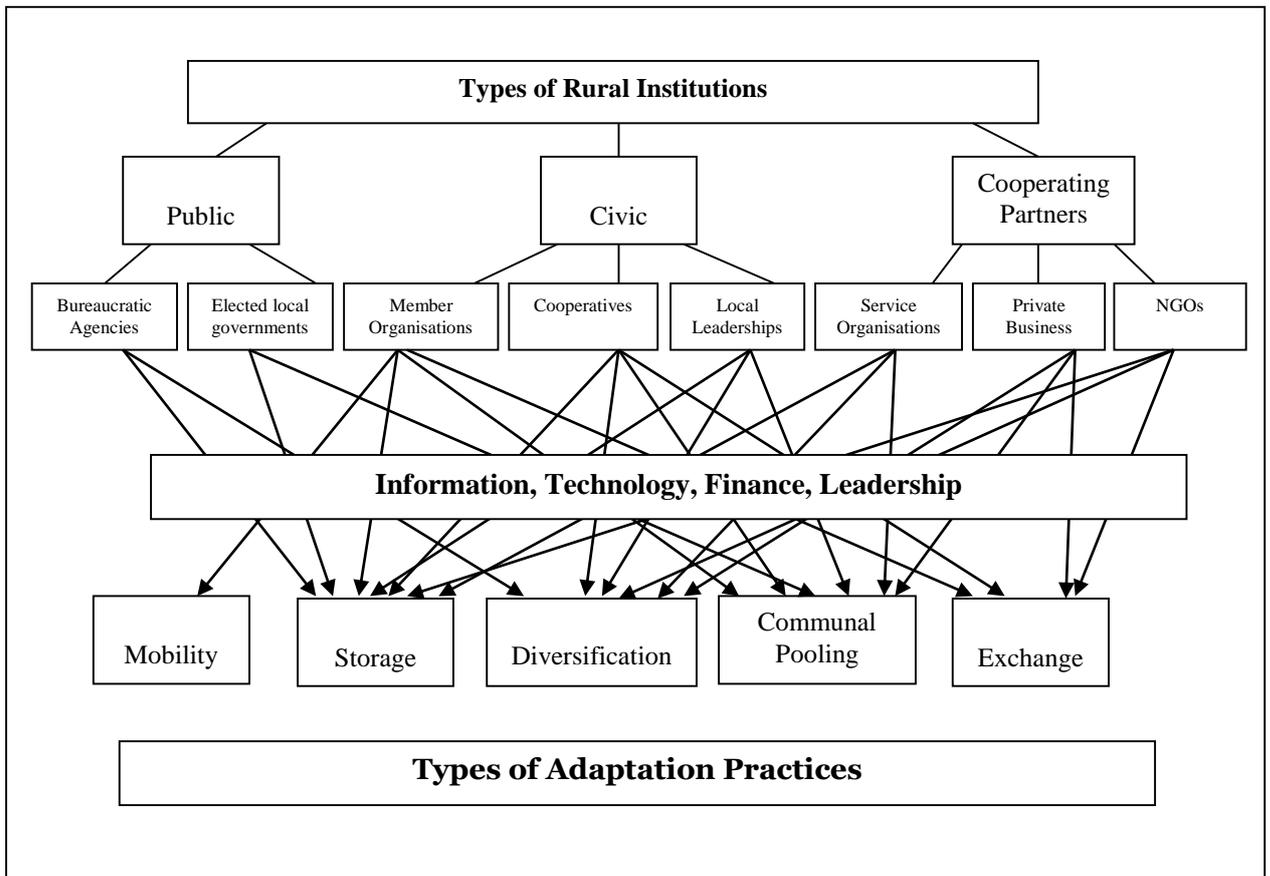
Thirdly, institutions act as a medium through which external interventions strengthen or undermine existing adaptation practices. Social safety net⁷ programmes, for instance, are an important factor to reducing environmental risks. These programmes may include cash transfers, food distributions, seeds and tools distributions, (Lipper et al., 2010) and are managed and spearheaded by different types of local institutions.

Without doubt, there has been an influx of social safety net programmes in the recent past, especially in African economies where effects of climate change disrupt the social order. But the exact manner in which institutions will generate effects of safety nets, for example, depends to a large extent on a variety of factors i.e. the severity of climate events e.g. floods or droughts, the local contexts, the interests of those whose decisions and actions translate into actions and outcomes and also the social and political factors within which institutions function (Agrawal, 2008).

Further, Agrawal (2008) explains how actors and institutions closest to local hazards enhance adaptation to climate change by using four different types of interventions. These include information and training; technological innovation, finance investment, and leadership to reduce costs of climate change outcomes (Figure 2-3).

⁷ Social safety nets are a form of social insurance comprising programmes supported by the public sector or NGOs that provide transfers to prevent the poor from falling below a certain poverty line (Lipper et. al, 2010).

Figure 2-3: Institutional mediation of external interventions to facilitate adaptation



Source: Adapted from Agrawal (2008)

Agrawal (2008) views these assets or interventions as mechanisms necessary to provide adaptive capacities for communities. Organisations and institutions based on their varying contextual settings and background will therefore advance context specific adaptation practices that are seen to bring out positive outcomes on the intended socio-ecological environment. The following discusses types of adaptation practices used to limit impacts of climate change.

2.2.2 Types of Adaptation Strategies

a) Mobility: In the context of responding to environmental risks, mobility is a strategy of movement used to address risks in a given location (Agrawal, 2008; Agrawal and Perrin, 2008). Tendencies of cultivation, productivity and habitation tend to shift with occurrence of spatio-temporal variations. It is important to note,

however, that different community groupings will react differently to mobility as an adaptation measure, if costs of moving outweigh the benefits.

Mobility is also a way of life for large groups of people in semi-arid regions⁸, and a long standing mechanism to deal with spatio-temporal variations in rainfall and range productivity. Mobility as an adaptation practice, therefore, is more or less desirable depending on the social groups being considered.

- b) *Storage:*** In the context of climate change, storage as an adaptation measure is relevant to individuals and communities to address food shortages, as well as water scarcities (Agrawal, 2008). In areas of less rainfall and longer drier periods, storing sufficient water in dams and reservoirs for irrigation may reduce crop failure even though, longer drier periods may mean that soil water conservation measures may fail to retain soil moisture effectively for crops (IWMI, 2009).
- c) *Diversification:*** This is a technique that pools risks across assets and resources of households and collectives (Agrawal, 2008). In general, the importance of increased diversity lies in promoting greater flexibility because it allows more possibilities for substitution between opportunities that are in decline and those that are expanding (Ellis, 1999). As many climatic changes most directly affect agricultural production, diversification on agricultural productivity through development and adoption of drought and heat resistant crop varieties, shifting of planting dates or changes in crop mix, has taken the centre stage in most policy discussions (Lobell, et al., 2008; Macours, et al, 2012).
- d) *Communal pooling:*** Is a technique that cuts across households. Communal pooling refers to adaptation responses involving joint ownership of assets and resources; sharing of wealth, labour, or incomes from particular activities across households, or mobilization and use of resources that are held collectively during times of scarcity (Agrawal, 2008). In the Simalaha area, some local Community Based Organisations are used to raise collective incomes by coming up with

⁸ <http://becomenomad.com/tips-on-how-not-to-lose-your-sanity-on-the-move/>

initiatives such as growing and selling of chickens to improve resilience against climate change when primary sources of income fail (Interview, 1:2).

- e) **Exchange:** Exchange is a factor of gaining access to markets. Not only does exchange promote adaptation to environmental risks, it is also important for specialisation, trade and wellbeing gains that result from specialization and trade at multiple scales (Agrawal, 2008).

As can be seen, types of adaptation measures proposed will always vary depending on the impacts of climate change. While others may propose that people prone to losing food supplies in flood or drought prone areas migrate from their usual dwellings to locations less prone to such climatic hazards, for instance, others will propose that storing enough food is the answer in years of surplus to avoid hunger in years of shortages in the event of droughts or floods. In the same vein, others will propose diversifying in livelihood activities away from crop farming such as livestock rearing or bee keeping, as well as community pooling of resources to improve access opportunities of limited resources. In other circumstances, exchanging goods and services may just be an option for other people to survive climatic challenges. Nonetheless, whether such mechanisms actually enhance adaptive capacities is a question of availability of such assets and people who gain access to them, as well as, institutional means of providing them (Agrawal, 2008). Further, although Agrawal's theory identifies that meso-level interventions may lead to different adaptation strategies that respond to community needs, these are only theoretical connections and may not actually play out as desired in practice.

In conclusion, defining institutions, as used in the study, offers an opportunity to distinguish institutions, as understood by various authors, and shows the perspective that best fits the context of this research. Understanding the proximity of organisations supporting and structuring climate change outcomes are thus of significant importance to this research because it sheds more light on their potential to trigger climate change adaptation changes on the ground, as well as interacting with higher level organs that could potentially finance adaptation processes or provide new interventions for advancement in climate change adaptation strategies.

2.2.3 Institutional Strategy in Response to Climate Change

While structuring societal outcomes and mediating external interventions, several processes come into play that will at times require institutions to make some operational changes to affect certain outcomes. Schouten (2009) proposes that the *strategy* used in responding to socio-ecological situations will ultimately determine outcomes of situations in different circumstances. By strategy, Schouten (2009) observes that it encompasses the pattern of choices in an organisation that shows objectives, purposes, or goals, and that which produces the principle policies and plans for achieving these goals. Further, strategy as discussed by Schouten (2009) also defines the range of activities the organisation is to pursue, the kind of economic and non-economic contributions it intends to make to its shareholders and communities.

Strategy can thus be seen as a plan of the course of action. Schouten (2009) argues that organisations will shape their strategy, structure and practices to suit prevailing environmental conditions, changes and uncertainties in what he terms as an “*adaptive cycle*”. The adaptive cycle is a composition of certain patterns of key choices of actions and solutions to problems encountered. Using this background, strategy as understood by (Schouten, 2009) has been contextualised into the study of climate change adaptation, and how organisations and institutions will take different actions when faced with environmental challenges or climatic hazards of which they have to adapt to.

In conclusion, strategy has been used to acknowledge that organisations faced with different circumstances of climate change will determine different outcomes based on the understanding of known socio-ecological situations. This is a clear example showing that there are no clear-cut processes and responses for all situations in climate change, but that different interventions are required to respond to specific situations. In this case, the kind of strategy devised should be well planned and understood to come up with appropriate strategies used on the ground for enhanced adaptation to climate change.

2.2.4 Institutional Change in Climate Change Adaptation

In enhancing local adaptation to climate change, institutions may bring in new measures to respond to experienced challenges. The concept of gradual institutional change is thus

used to explain subtle changes of institutionalised behaviours and practices as new ideas and norms become merged (Peters et al., 2012). This theory is of the view that everyday actions and interactions of organisational ‘actors’ will shape institutional changes in the face of climate change. New institutions or roles may, for instance, be formed to improve on the provision of early warning mechanisms during floods and lessen impacts of potential floods within the wider framework of disaster risk reduction. The new structures, however, are not meant to displace the existing structures in responding to hazards, but work to enforce proposed response strategies.

In this framework, however, an extended explanation is provided that shows that conditions of institutional change are not always clear cut and sometimes institutions will strive to maintain the status quo even when faced with hazards such as floods; as is the case with path dependent institutions (Campbell, 2010). In this research project, however, theories of institutional change are used to appreciate how institutions respond when challenged with the need to shape societal outcomes.

Arguments in support of path dependence observe that institutions will maintain the status quo against the background that creation of new institutions come with a high cost such that once institutions have been created, actors will not seek to change them, particularly if they perceive that more costs would be incurred with new changes in place (Campbell, 2010; Peters et al, 2012). This can be seen in light of ‘ineffective’ decentralised management systems. While so much discourses go on about the importance of decentralising administrative and financial resources to local structures for effective implementation and response when local communities are confronted with disasters such as floods, sometimes, such sentiments speak volumes, but only on paper. There is a growing tendency for the governance systems, especially in developing countries, to limit institutions at local level to exercise leverage and financial freedoms as governments in unitary states such as Zambia, retain funds at central government level and only disburse it when need arises for use at local level (see Tadesse, 2010; Overseas Development Institute (ODI), 2012). One argument towards this view is of the notion that it is better to work with an institution where trust has been created in managing finances for the country at central government level, than risking channelling funds to

local level institutions with less experience in financial management and limited capacities to provide effective and efficient services (see Faguet, 2003).

Clearly, it makes sense to have reservations of this nature because mismanagement of funds can lead to worse situations if targets are unmet. Nonetheless, it could also mean that reinforcing such measures benefit the government of the day in wielding more political power, as observed by Campbell (2010) than would the consequences of trying to improve financial freedoms in local institutional structures closest to climatic challenges.

Other factors for maintaining the status quo look at how institutions are sometimes created – with extreme procedural processes such that changing them becomes difficult. They may, for example, make obligatory that express permission be obtained from the office of the Vice President under the Disaster Management and Mitigation Unit (DMMU) by all line ministries with respect to responding to matters of disaster risk reduction. Cases requiring immediate response will not go against this tendency because it has been used and trusted as the best means over time.

In conclusion, when faced with climate change challenges, institutions may bring in new measures to respond to experienced challenges. In some cases, institutional reproduction will occur to accommodate new phenomena. In other instances, institutions will tend to change completely when confronted with internal or external forces. Saleth and Dinar (2004) discuss various processes through which changes may occur in institutions. These may include, but not limited to, endogenous factors such as scarcity of natural resources, performance deterioration of the institution and financial non availability, as well as exogenous factors such as macroeconomic crises, political reform, natural calamities and technological progress.

2.3 Conclusions

The literature review chapter has defined and exemplified what is termed as climate change adaptation showing its relevance to the study area. Further the literature review maintained its focus on climate change adaptation because it is the understanding of

adaptation practices and support of the organisations given to local communities that is relevant to this study.

The literature review, further pointed out the importance of understanding vulnerabilities, risks and hazards to climate change. Of importance, the literature stressed several factors that could enhance or inhibit vulnerability as being geological locations, gender, age, livelihood and access to resources and entitlements. Therefore, exposure to hazards does not necessarily translate into risks but that is qualified by the degree of vulnerability of individuals or systems in relation to the hazard. When advocating for adaptation for local livelihoods and processes, such considerations should be made by organisations or institutions because that is what promises enhanced adaptation outcomes, rather than using uniform policies and measures known to have been applied and succeeded elsewhere and not specific to areas in question.

Further, the analytical frameworks interrogated the role of institutions or organisations in supporting local climate change adaptation. Through this review, local institutions or organisations are recognised as systems better placed to support local communities effectively because of their proximity to local hazards hence possess better understanding of advancing appropriate adaptation practices. This understanding is complemented by the study of strategy in climate change adaptation because it offers different courses of actions to be taken in determining the route to take in advancing different options for climate change adaptation at local level.

CHAPTER 3

STUDY METHODS

3. Introduction

This study was undertaken in the Simalaha area of Kazungula and Sesheke districts of Zambia (see Figure 1-1 above). It covered four wards namely Sikaunzwe and Ngwezi in Kazungula district, and Mwandu and Mabumbu, previously in Sesheke district, though the recent subdivision of the districts has transformed Mwandu to a district. The study focused on areas experiencing climate change in the four wards highlighted above. Institutions (i.e. district, provincial and national) with stakes in supporting adaptation to climate change also formed part of the sources of information for this study.

3.1 Research Design

Both qualitative and quantitative research designs were used in this study. By qualitative research is meant exploratory research methods (Kothari, 2009). Some of the methods used under qualitative research include focus group discussions, individual interviews and observations (Kothari, 2009). This technique was used to gain an understanding of personal experiences of climate change in the study area and explore institutional interventions used in promoting adaptation to climate change in the Simalaha area. Qualitative research methods also explored the extent to which communities responded to adaptation intervention supported by meso-level institutions.

Quantitative research, on the other hand, is used to quantify the problem by way of generating numerical data that can be transformed into useable statistics (Kothari, 2009). The quantitative research technique used for this research was the household questionnaire survey to measure the extent to which various interventions of climate change adaptation were experienced by communities of the Simalaha area.

3.2 Sampling Techniques

Sampling is the process of selecting units (e.g. people, organisations) from a population of interest so that by studying the sample, we may fairly generalise our results back to

the population from which they were chosen. The sampling techniques used were threefold – purposive, random and stratified random sampling techniques.

3.2.1 Sampling for Institutional Sources

The sampling of institutional research participants was done purposively. By purposive sampling is meant non-probability subject sampling by including groups or typical areas in the sample that are tied to specific objectives (Palys, 2008). In this respect, firstly, all government institutions, line ministries and local NGOs in Kazungula and Sesheke districts, with interests in climate change and adaptation, were mapped out and listed down on a piece of paper. Identification of institutional sources also targeted individuals with knowledge of the climate change agenda in the Simalaha area and how meso-level institutions had responded to enhance climate change adaptation. Mapping of institutional research participants also included representatives of meso-level institutions. For in-depth interviews, the total number of institutional sources and individuals identified for to be working with climate change or those with knowledge of the climate change agenda at district, provincial and national level came to 56. Of this total, 15 persons were from Kazungula district and 24 from Sesheke district. Details of actual persons sampled in Kazungula and Sesheke districts are provided in Appendices 1 and 2, respectively. These were then sampled as research participants for in-depth interviews because they had knowledge of the climate change agenda in Zambia as well as in the two districts of Kazungula and Sesheke districts.

Further, of 56 institutional sources mentioned in above, 17 research participants were identified from national level and provincial level in Livingstone. The selection of research participants at national and provincial level in Livingstone was included in the sample because of existing coordination and collaboration between the national and lower levels of government in implementing climate change activities at lower levels. The national and provincial level research participants were therefore sampled to ascertain interactions of the national and meso-level institutions in enhancing adaptation to climate change at local level. Details of sampled research participants at national and provincial level are provided in Appendix 3.

Secondly, as part of the Climate Change and Rural Institutions (CCRI) Project meeting invitations were sent out at two different occasions (i.e. beginning of the study, and towards the end) to different government line ministries and NGOs in Kazungula and Sesheke districts with experience on climate change issues to participate in consultative workshops to inform the research on climate change events in the two districts and responses of meso-level institutions thereof. For the consultative workshops, a total 108 meeting participants turned up. During the first meetings held on 25th and 26th June 2012, a total of 28 and 29 workshop participants turned up for the Kazungula and Sesheke consultative meetings, respectively. During the second workshops held on 5th and 6th of November, 2015, 18 and 31 participants turned up, in Kazungula and Sesheke districts, respectively. Appendix 4, 5, 6, and 7, shows lists of participants for the consultative meetings held in Kazungula and Sesheke districts on the four different occasions – two meetings in each district.

3.2.2 Sampling for Household and Community Sources

At community level, a list of wards within and surrounding the Simalaha Plains was provided by Kazungula District Council showing all areas in Kazungula and Sesheke districts. From this list, four wards were selected purposively, including Sikaunzwe and Ngwezi in Kazungula area and Mabumbu and Mwandu in Sesheke area. Purposive sampling was used because the selection criteria targeted wards that were known to have shared similar characteristics of floods and droughts prior to the study.

Secondly, using a list provided by Kazungula District Council, communities that had previously experienced floods and droughts were identified. The identified communities were then stratified in small groups according to their respective wards with an exception of Namapande⁹ resettlement area of Kazungula. Stratified random sampling, also sometimes called proportional *or* quota random sampling, is a sampling technique that involves dividing populations into homogeneous subgroups and then taking a simple random sample in each subgroup. Based on the total number of households stratified according to each ward, a percentage share out of 20 communities was calculated to

⁹ Namapande community was selected purposively because it was the only one identified to have been used as a resettlement area for flood victims for the 2008 extreme flooding of the area.

ensure that all communities identified had an equal chance of being included in the sample. Then, a random sample of communities from the stratified list of those with similar characteristics was drawn by assigning each community number(s) and then randomly selecting 20 numbers corresponding to 20 communities as exemplified in Table 3-1¹⁰.

Table 3-1: Community sampling for household survey

District	Wards prone to droughts and floods (sampling stratum)	Total households (CSO, 2010)	Ideal number of communities to be selected from the wards	Selected Communities
Kazungula	Sikaunzwe	1,716 (31%)	6	Namapande Kawana Candela Bbilibisi Muteto Ngalata
	Ngwezi	2,053 (37%)	8	Kachabula Nalituwe Mukengami Munambwe Sililo Maibwe Siankande Tomu- Muyambango
Sesheke	Mabumbu	888 (16%)	3	Namangu Mulombwe – Kasaya Makanga
	Mwandi	874 (16%)	3	Mwandi-Central Sikuzu Sooka
Total		5,531 (100%)	20	

Source: CSO (2010); Records from Kazungula District Council and community informants from Sesheke districts

Actual communities selected for the household survey included, Namapande, Kawana, Candela, Bbilibisi, Muteto, Ngalata, Kachabula, Nalituwe, Mukengami, Munambwe,

¹⁰ Sampling strategy used was adapted from methods developed collaboratively by partner research countries of the Competing for Water research programme – 2007 to 2011.

Sililo, Maibwe, Siankande, Tomu-Muyambango, Namangu, Mulombwe-Kasaya, Makanga, Mwandu-Central, Sikuzu and Sooka. Twenty communities (Table 3-1) were selected for this study because they were fairly manageable and could very well represent views of other communities that had previously experienced environmental hazards in the area, considering only communities within and surrounding areas of the Simalaha plains were being investigated and not the entire two districts of Kazungula and Sesheke.

Thirdly, from each of the selected communities shown in Table 3-1, 10 households (household heads) were selected randomly as research participants for the household survey, totalling the number to 200 household respondents. The selection of household respondents was done randomly, by selecting every third household on the community lists¹¹.

Fourthly, using the list of communities sampled for the household survey (see Table 3-1), a single community was selected randomly, in each ward, bringing the total to 4, to conduct focus group discussions on the climate change agenda and responses thereof. Communities sampled include Mwandu Central, Mulombwe – Kasaya, Kawana, Siankande. In addition to the 4 communities selected randomly, an additional community called Namapande was sampled purposively because it was the only community that had previously been used as a settlement area for post flood victims of 2008.

Fifth, wealth rankings were conducted to understand how different wealth groups responded to climate change variation and their access to institutional support in the face of climate change and variation. Using the list sampled for the household survey, all communities (i.e. 20) were sampled and administered with community wealth rankings. Sampling of participants for this exercise was done purposively by identifying ordinary individuals who had lived within the same communities for a long time and had a general knowledge of the livelihoods and wellbeing of other community members.

¹¹ Community lists of all households were obtained from the local leaders, i.e. *Indunas*

3.3 Piloting

Before commencement of full data collection, the instruments were pre-tested to confirm feasibility and clarity in terms of yielding reliable data. This was done further to test field procedures and processes to be used during actual data collection. Based on the pilot results, some few changes were made to the instruments to ensure that the questions provided clarity and adequacy.

3.4 Data Collection

Collection of data involved varied techniques to include in-depth institutional interviews, consultative workshops/meetings, household surveys and focused group discussions. Other methods used included wealth rankings, methods of observations and document review and analysis processes.

3.4.1 In-depth Interviews for Institutional Respondents

Investigating institutional support to climate change adaptation started by mapping out institutions working on climate change adaptation in the study areas. The research systematically described institutional arrangements, key sectors, policies and plans relevant to climate change and the governance scenery including main actors at national and district level, including their strategies used to enhance adaptation to climate change. Using unstructured interviews, institutional actors of a total sample of 56 research participants (15 Kazungula, 24 Sesheke and 17 Livingstone and Lusaka) shown in the preceding sections recounted their actions and those of others since the emergence of climate related concerns in the study areas and how they acted to enhance adaptation. Unstructured interviews were chosen for this study because they allowed the participant to discuss their opinions, views and experiences fully and in detail. Questionnaire guides (Appendices 8, 9 and 10) were used during the interviews to ensure that there was a comprehensive coverage of the topic during interviews.

Further, interviews were on a face to face basis. This criterion of interviewing respondents was chosen because of its importance in allowing the researcher to observe any non verbal communication but also allow both the interviewer and the participant

to see that all ambiguous questions and issues were clarified since the interviews were conversational in nature.

3.4.2 Consultative Workshops

The consultative workshops/meetings also formed part of important sources of data for the study. Meeting participants were broken down into groups to deliberate on different topics relevant to the study. Thereafter, plenary sessions were held in which participants gave feedback about the outcomes of their discussions. This was done to necessitate further probing into the topic of climate change and response strategies used if issues raised needed further clarification. Figure 3-1 shows some of the activities conducted during the consultative workshops.

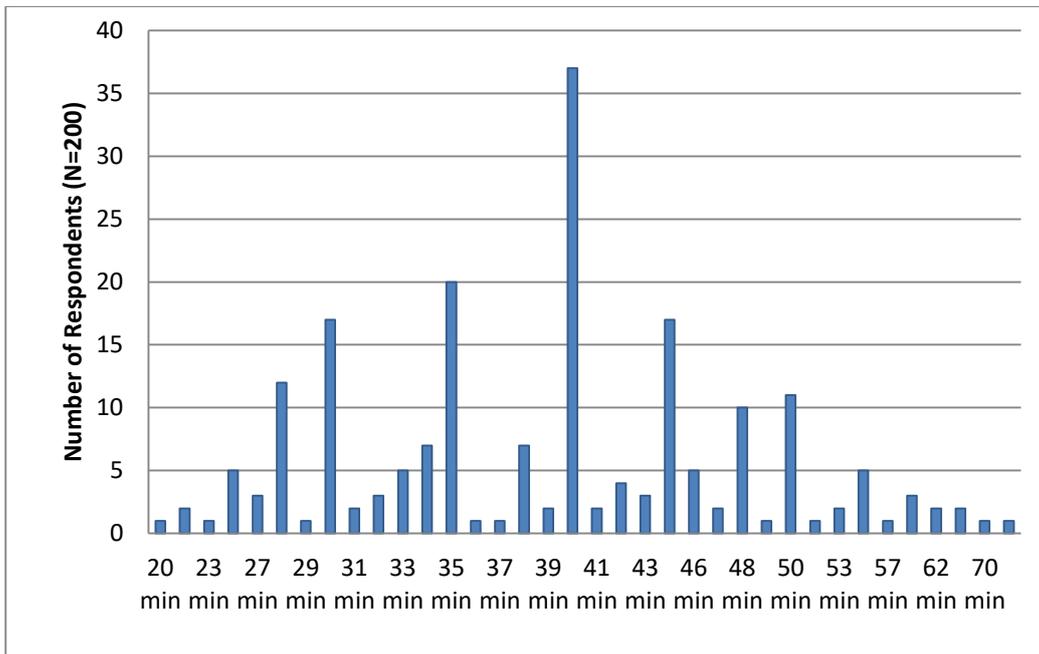


Figure 3-1: Workshop of the climate change and rural institutions projects

3.4.3 Household Survey

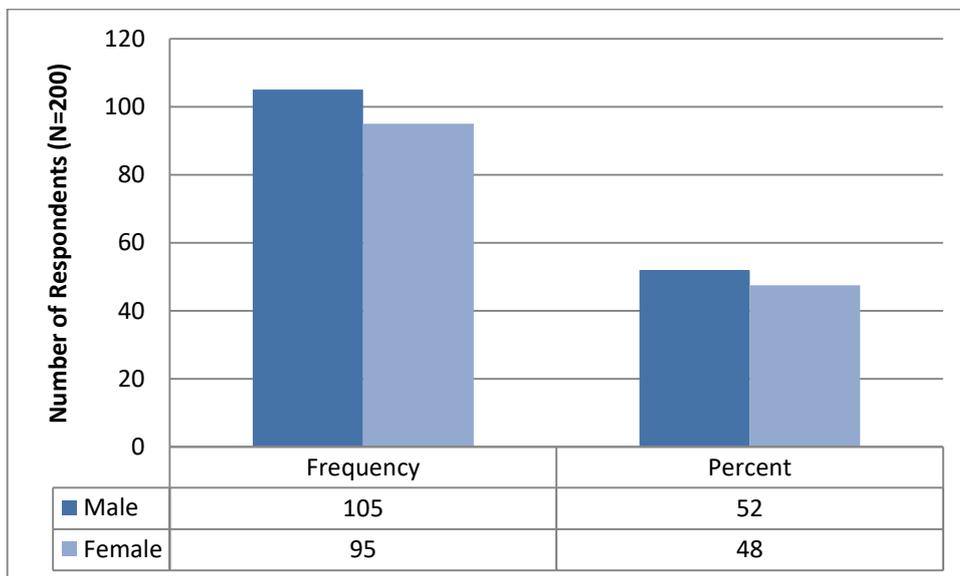
A household questionnaire survey was administered on face-to-face basis to 200 selected community members in the Simalaha area and responses written down in the questionnaire format (Appendix 11). Each interview lasted for about 20 to 70 minutes (Figure 3-2). The amount of time spent by the majority of respondents (accounting for 37 research participants) was 40 minutes as shown in Figure 3-2. The average amount spent for conducting interviews was determined by how promptly respondents were able to comprehend and respond to questions asked.

Figure 3-2: Duration of household questionnaire survey



Effort was made to get views from both sexes. Figure 3-3 shows numbers and percentages of males interviewed in proportion to females.

Figure 3-3: Sex of Respondents



3.4.4 Focus Group Discussions

Focus group discussions were used to enhance understanding of issues that could not be tackled adequately during the household surveys. FGDs devoted more time debating changes observed in the climate over time and solutions used or adaptive responses used to enhance climate change adaptation. To achieve better success, the groups were well briefed on the purpose of the study, making them more willing to participate; with group size between eight and fifteen being optimal. The groups were selected on the basis of gender, age, educational status, interests and ethnicity – a representative mix was essential. A total of 5 focused groups were held: 3 in Kazungula and 2 in Sesheke and comparisons drawn between them in aid of triangulating results. The following approach was used:

- Presentation of an overview of understood risk and vulnerability in the study area and how institutional actors have responded to improve adaptation of such risks;
- Foster discussion of general contextual settings of climate change that influenced response from meso-level institutions in trying to enhance adaptation; and the extent to which adaptation measures were adopted in their everyday work frameworks;
- Probe perceptions of whether or not institutional interventions and activities observed by community people led to changes in institutional mandates and brought about new local practices;
- Foster discussion on livelihood structure and vulnerabilities thereof;
- Probe the perceptions of the processes and approaches used by district level institutions to enhance adaptation to climate change;
- Probe perceptions of the climate or weather in more depth, making clear links to vulnerability, socio-economic related impacts and potential future changes;
- Getting the participants to develop a set of adaptation options proposed by district level institutions that were then prioritized so as to inform an integrated adaptation strategy;
- Get participants to state actual adaptation strategies used at community level.

The interview guides used in conducting focus group discussions are presented in Appendices 12 and 13. Results of the focus group discussions are presented in Appendix 14.

3.4.5 Wealth Ranking¹²

By definition, wealth rankings assess the extent to which different groups or individuals will have access to or control over important economic resources; often observed through higher levels of income and expenditure (Grandin, 1988). Developing community wealth rankings was inspired by the consideration that inequalities existed in every community (Grandin, 1988) and that different wealth groups responded differently to hazards and stressors (Boko et al., 2007; Ribot, 2012). Moreover, societies define some differences between its members as being of great importance and tend to value certain characteristic above others (Grandin, 1988). For instance, despite, the whole study being undertaken in the Simalaha area, what constitutes important sources of livelihood in one community e.g. fishing or rice production in flooded communities may be seen as a hindrance to development for other communities grounded on maize production as a way of livelihood, for instance, which does not depend on flood waters to thrive. These social differences are important to understand and realise what would constitute a hazard for different communities and how each community responds. In addition, wealth rankings were also used to understand if there were differences in the way different social groups accessed institutional support in the face of climate hazards and climate variation.

As a first step towards developing the wealth ranking, a general understanding of the ecological diversity for the entire study area was established. Information important for this understanding included general surface area, natural conditions, and human and livestock populations, generally obtained from local informants, local extension workers and documented reports.

The next stage involved sampling of communities to conduct the wealth ranking. Selection criteria used is described in the preceding sections under community sampling section.

From the selected communities, a knowledgeable informant, who also knew community members very well, was selected purposively to offer background information and assist in determining existing major differences between communities. Information that

¹² Based on Barbara Grandin's field manual of conducting wealth rankings in small holder communities.

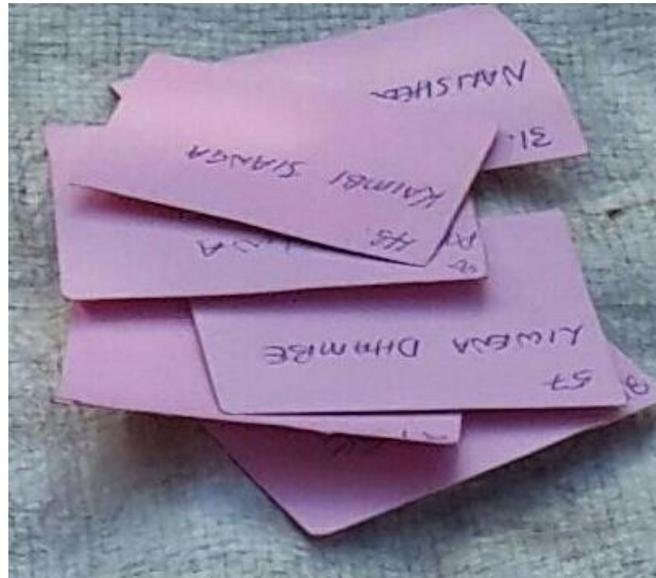
distinguished each community from another was determined in terms of distance to town/markets, availability of roads, existing or past developmental group/development programmes, population density, size of land holdings, age of settlement and relative wealth (and why) of different communities. In cases where different ethnic groupings predominated in communities, this information was important to understand how each group would access institutional support and respond to climate change variability. Further, with the help of an assistant fluent in the local languages of *Lozi* and *Toka-Leya*, the informant discussed and delineated what constituted a community¹³ in order to have an understanding of the extent for the wealth rankings. In this case, a community was defined as people grouped in neighbourhoods or villages under a common local leader also known as a headman or *induna*. The concepts of ‘wealth¹⁴’ and ‘household¹⁵’ were also discussed in local languages to decide on common phrases to use for uniformity. The informant also provided names of all households, because these informants had to be individuals that had lived in the communities long enough to know everyone within the community and had a general idea of everyone’s well-being in the community. The names of households provided were captured using household heads and then written on pieces of paper, verified and numbered. Further, the same names and numbers of each household head were written on index cards (Figure 3-4).

¹³ **Defining the community and its boundaries** – With the help of a local informant a general sense of local socio-spatial organisation was obtained. A community or neighborhood contained 100 or less households. Again, a community was not supposed to be too small otherwise sampling bias would have occurred

¹⁴ **Wealth** is defined in terms of access to or control over important economic resources; it is often observed through higher levels of income (and expenditure) – but these are indicators of wealth rather than themselves constituting wealth. (To ensure the comparability of the data obtained from various informants, as well as to ensure that households are ranked according to the criteria the researcher desires, it is important to determine the best indigenous concept to use for ranking.

¹⁵ **Household** is defined as a group of people (normally related) who live together and ‘eat from the same pot’.

Figure 3-4: Index cards used to rank households according to their levels of well-being in the study area



After establishing background information of the communities, as well as names for each household, the subsequent stage involved identifying informants (3 to 4) in each community that could assist in carrying out the wealth ranking. Again the informants were selected purposively by identifying and selecting people who knew people residing in the community very well and had an idea of their general well-being.

As a first step towards familiarising informants with the exercise, an assistant fluent in the local language found a quiet place and explained the purpose of the exercise. Introducing the exercise to the informant entailed discussing how different 'rich' was from 'poor' generally in the area and how different problems of rich and poor people were. Further, the chosen word for wealth in local language was discussed to verify whether or not it fitted with the informants own definition. The household concept was also explained, that names on cards stood for the whole household and not just the household head. The actual card sorting exercise was also explained to them – that informant had to rank households in as many piles as they wanted and could change the number of piles in the course of it.

If the informant was agreeable to continue with the interview, the cards were shuffled and one by one, the informant placed the cards in piles based on their perception of each household's level of wellbeing (Figure 3-5).

When complete, the informant was asked to review each pile to be sure cards were placed in the right pile – if not, changes could be made.

Figure 3-5: Research participant conducting wealth ranking in one of the communities in the study areas



After the card-sorting exercise, the piles were counted to make sure that there were no more than 40 percent of households in any one pile. If a pile consisted of more than 40 percent, the informant was asked to subdivide the piles so that no group of piles had more than 40 percent of households grouped. Thereafter, household numbers as presented in piles were written down on a recording sheet (Table 3-2).

Table 3-2: Example of a recording sheet used to capture responses of the wealth ranking

INFORMANT 1	
Informant:	MORGAN MUTAKELA
Sex:	MALE
Age:	54
Neighbourhood:	SIKUZU
Assistant:	MUNALULA LIBUWE
Date:	14/04/2014
Level 1 (Richest) :	7, 9, 16, 17, 40, 55, 56, 39, 44, 10,
Level 2: (Upper middle)	1, 8, 11, 12, 13, 14, 15, 19, 21, 22, 23, 27, 29, 30, 31, 38, 41, 43, 45, 47, 50
Level 3: (Lower middle)	3, 4, 5, 6, 25, 26, 32, 34, 35, 36, 37, 42, 46, 52, 54
Level 4 (Poorest):	2, 18, 20, 24, 28, 33, 48, 49, 51, 53, 57
COMMENTS	
<p>Well-being Level 1</p> <p>Members of this group own cattle of 10 or above. When it comes to farming, they do not rely on other people's draught power because they have their own oxen to plough. In times of famine or crop failure, they do not stay hungry because they can afford to sell their livestock to buy food and sustain their households. The community regards them to be more advantaged in terms of wealth as compared to the rest of the community.</p>	
<p>Well-being Level 2</p> <p>These own 1 or 2 cattle. Some also have children outside the village that support their livelihood from time to time. They cultivate their lands to feed their households, but only on a subsistence level.</p>	
<p>Well-being Level 3</p> <p>They do not own any cattle though they engage in some farming activities at a very small scale. They cultivate very small pieces of land because they have no draught power. They also depend on other people with oxen to cultivate their land. Some of them recently moved out of their parents' home to look after themselves; hence they are not yet established. They also engage in fishing activities to survive. Within this same group, others are old and are supported by relatives and external family members. When faced with droughts or their crops fail as a result of floods, they can easily go fishing and also work in other people's fields to survive.</p>	
<p>Well-being Level 4</p> <p>Some of the people in this group are too old to work while others are widowed with no means of survival. Most of these people depend on community hand-outs. They also don't engage in any farming activities because they cannot afford to own land and crop inputs. If they cultivate their small pieces of land, hardly anything comes out of it. They generally have very limited or nothing to eat if no hand-outs are given. In times of drought or crop failure, they have to depend on government for survival. While others within the community might be able to work for the work, they have no strength to work for food given by government hence they are given free of charge. The government or NGOs also consider them first</p>	

in priority when there is support of food or any form of support given to the community because they are considered to be the most vulnerable. If no support is given, they suffer the most because they can generally not respond properly to droughts or floods because they have no alternative forms of income.

Additional comments

People from different wealth groups are affected by climate variations differently and suffer from different challenges e.g. in times of droughts, very old people depend on government support for food, while younger and stronger people will be able to work under the food for work programme, piecework and also do some fishing to earn income. People in group one (richest), for instance, can sell their own livestock to raise money even that which is required to educate their children.

In addition, there are differences in access to institutional support among different people from various wealth groups in that the poorest for instance are considered first when food and other things are being distributed. Moreover, the poorest do not even need to work for food being distributed as it is just given to them for free. Further, there are differences in response strategies among different wealth groups, in that while the richest may sell their livestock to earn incomes following a crop failure, the middle and low income groups may engage in day labour and also catch fish.

The card-sorting technique was followed with discussions of what generally characterised households in each pile. Responses were recorded by pile number. Further, informants were asked to explain how different wealth groups responded to climate variations and whether or not there were any differences in access to institutional support over climate change variations between different wealth groups. Additionally, informants were asked to explain whether or not there were differences in the way people from different wealth groups responded to climatic hazards.

The preceding methods were then repeated with 3 to 4 respondents within the community using a checklist presented in Appendix 15 and responses recorded accordingly (Appendix 16).

Thereafter, when all informants (3 to 4 per community) had undertaken the interview, the scores for the informants were then combined to obtain an average score for each household. This process begun by giving each household a score for each informant which was calculated as its pile number divided by the total number of piles multiplied by 100.

The Score is: $\frac{\text{Pile number of household}}{\text{Total number of piles}} \times 100$

Total number of piles

For each household, these scores were then added together, and then divided by the number of rankings available to get a final average score for the household (see Appendix 16 in the wealth rankings descriptions and tabulations for details). The average score was written for each household in large numbers on the index cards and the index cards put in order from lowest to highest average score (rich to poor). Details on the index cards were then copied on a sheet of paper in that order: the position number, the average score and the household number and divided into 3 groups of near equal size. Names of ranked households corresponding to some names in the household survey data were then included in excel and SPSS data formats and analysed quantitatively.

3.4.6 Observations

Observation of the adaptation strategies used on the ground were undertaken to verify some of the responses given (i.e. during FDGs, household survey and in-depth interviews with institutional respondents).

3.4.7 Document Review

An extensive review of relevant literature, including publications and reports of recent work on the topic of climate change adaptation, was done, including relevant policies and past work on climate change in general.

3.5 Methods of Data Analysis

Methods of data analysis were threefold. All quantitative data gathered during household surveys and wealth rankings was recorded in Statistical Package for Social Sciences (SPSS) data formats and transposed into Excel data formats. Both SPSS and Excel were used to analyse all responses of the questionnaires to bring out statistical representation of data in frequency tables and figures. Descriptive and inferential statistics were calculated to describe the responses and test the significance of associations between relevant variables.

For the qualitative data obtained from in-depth interviews, consultative meetings and FDGs, synthesis, analysis and interpretation were an on-going process during the study period. Three processes were blended throughout the study: collection, coding, and

analysis of data. For this process, Colaizzi's (1978) methods of data analysis were used where:

- a) All descriptions given during the interviews were read to acquire a feeling for them;
- b) Important phrases or sentences that directly pertained to the phenomenon were extracted;
- c) Meaning of each significant statement was formulated;
- d) Organised the formulated aggregate meanings into clusters of themes;
- e) Analysis and write up

Thorough reading and re-reading of the data was required to ensure all recurring data and variations were identified.

3.6 Validity and Reliability

Validity and reliability are some of the criteria used in social research. Validity is concerned with whether the measurements provide the information needed to answer research questions (Cooper and Schindler, 2003). Bryman (2012) defines validity as, 'the issue of whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept'. For any research to be trusted and worth reading, it must be seen that the process involved was valid and believable. It has been argued that "there is no ultimate demonstration of validity, but we can maximise clarity and agreement and make validity more, rather than less, likely" (Sithole, 2011). Therefore, in order to attain validity, the study systematically applied the concept of multiple operationalization, or triangulation, of findings from several research methods (both qualitative and quantitative) rather than artefact results of the single research methodology (Johnson et al., 2007). In this case, results from the household surveys, in-depth interviews and focus group discussions were used to explain findings on related topics during the research period.

Validity is closely related to reliability because a measure can only be said to be valid if it is reliable. However, reliability is particularly connected to quantitative studies where the main aim is the 'repeatability' of the results in a study and having consistency in the measures. According to Yin (2009:45), "*the objective is to be sure that, if a later*

investigation followed the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the similar findings and conclusions”. Particularly, reliability refers to the degree to which the selected research design produces the same result when employed in other studies of the same nature (Creswell, 2009; Golafshani, 2003). The main idea of reliability is to reduce biases that come with the methods used and errors that accompany them. In this study therefore, systematic scientific procedures were adhered to when conducting the research. For instance various research instruments designed were pre-tested during the pilot study and improving theoretical understanding of the research using other studies strengthened the reliability of this study. Additionally, the use of multiple sources for data collection was done to improve reliability of the research.

3.7 Possible Sources of Error and Bias in Methods Applied

A research that investigates work mandates and responsibilities of institutional actors in supporting adaptation to climate change adaptation may be compromised by respondents if they are trying to glorify their adaptation efforts. For example, institutional actors would argue that they have been actively supporting community adaptation because that’s what the government policy requires them to do, when in actual sense, they may not be doing much to support communities to adapt to droughts and/or floods.

During the study, such biases were minimised by use of triangulation. Responses provided by meso-level institutions about kinds of efforts they made to support community adaptation to climate change were verified through further interviews conducted with community sources on the ground. This improved the validity of the research results.

Secondly, during data collection, if an interview was started by talking about climate change, this meant that respondents would tend to explain most responses in line with climate change, even though the projects, for instance, that might have been implemented were not instigated to avert effects of climate change. For example, meso-level institutions discussed support such as fertilizer and seed input support as a means of improving crop productivity in drought prone areas. Yet, seed and fertilizer support is

also used to support farmers' elsewhere in Zambia through the Farmer Input Support Programme and not necessarily to reduce effects of climate change. This meant that, further probing had to be done to ensure that discussions of community support only focused on projects that were implemented to reduce the effects of climate change. In some cases, community sources were used to account further whether or not effects of climate change prompted meso-level institutions to support communities in the Simalaha area.

Thirdly, if respondents were not clear about whether or not the PhD research project would eventually implement projects to support adaptation to climate change, they tended to make effects of climate change sound worse than they really were. For example, they exaggeratedly stated that they were starving because their crops failed as a result of droughts. Making effects of droughts sound worse was done simply because they wanted a project implemented that would support them to reduce the effects of hunger. To ensure that such biases were minimised, the purpose of the PhD project was stated from the onset i.e. that it was strictly for academic purposes and that no support would come from the interviews being conducted.

CHAPTER 4

OVERVIEW OF CLIMATE CHANGE IN THE STUDY AREA

4. Introduction

Although the focus of the study is not to engage into a debate on whether or not climate change exists in the study area, an overview of climate change in the study area is necessary. The purpose of this chapter, therefore, is to give a brief overview of climate change in the study area based on the previous scientific studies that explain the existence of events that are attributed to climate change. Such an explanation will effortlessly lead to the understanding of what it is that institutions are responding to support community adaptation in areas affected by climate change and other environmental changes. In this research, the topic of climate change is discussed based on (i) scientific studies done on climate change and (ii) how local people within the study area perceive climate change in the Simalaha area. Detailed discussions are presented in the succeeding sections.

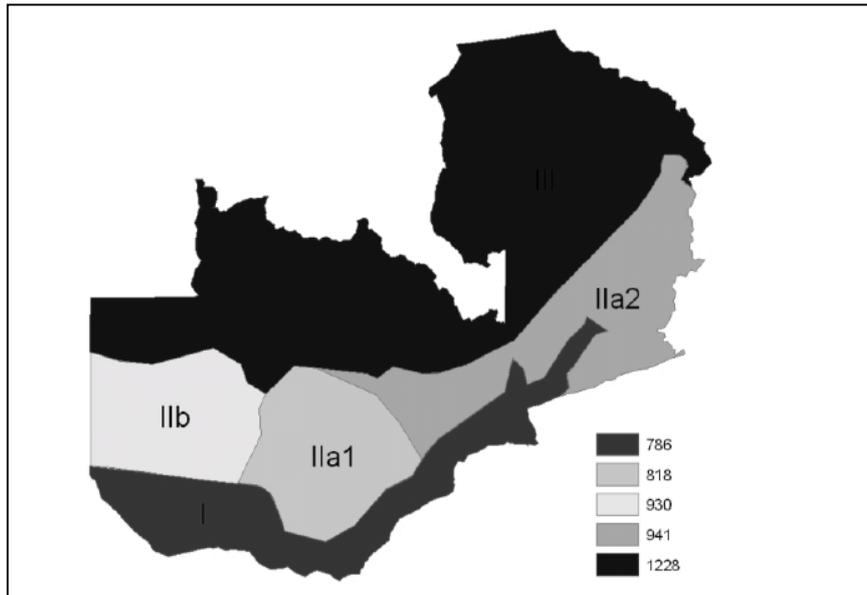
4.1 Scientific Perspectives of Climate Change

In the recent past, many scientific studies have pointed out that climate change is impacting people's wellbeing and general livelihoods (see Usman and Reason, 2004; Tadross et. al, 2005; New et al., 2006; Boko et al, 2007; Stal, 2011; Mare, 2011). Major arguments in these studies suggest that economies, biodiversity and livelihoods are continuously impacted now more than three to four decades ago due to climate change (Kandji et al., 2006; Adger et al., 2007; OECD, 2009; Boko et al., 2007; Easterling et al., 2007). However, while it is clear that scientists recognise the occurrence of climate change, in the Simalaha area, there is still a limitation of documented literature analysing climate change strictly for the study area. Analysis of climate change in the Simalaha area is, nonetheless, covered through wider climate change discourses for Agro-ecological Region 1 because the Simalaha area is geographically situated in Agro-ecological Region 1¹⁶ (Figure 4-1).

¹⁶ Agro-ecological Regions are land resource mapping units, defined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use (FAO, 1996).

Therefore, comprehensive analysis of climate change in this section will include views pertaining to the Agro-ecological Region 1 and generalise such discussions to include the Simalaha area.

Figure 4-1: Zambia's Agricultural Regions and average annual rainfall



Source: Thurlow et al., 2008

4.1.1 Extreme Floods

Since many decades ago, the Zambezi and its tributaries have caused flooding in Agro-ecological Region 1 (WMO/GWP, 2004). Essentially, there are two most pronounced classifications of flooding in the area. Firstly, there is the seasonal flooding, resulting from normal yearly rainfall, especially during the peak of the rainy season in January to February. Secondly, the not-so-common cyclone-induced flooding resulting from heavy rainfall that comes about when cooler and warmer humid air meets in a weather front and the less dense warm air rises and condenses forming clouds to create rains (WMO/GWP, 2004). In the last two decades, however, flood occurrences especially of the latter have increased. Literature shows that the last two decades, particularly, the 2000s have seen an increase in severe floods, most of which left the majority of people without food or

shelter (Mwape, 2009; ZVAC, 2009). In Table 4-1, major floods affecting Region 1 since the 1980s are shown, including estimated numbers of people affected.

As shown in Table 4-1, all periods except for the year 2004 have impacted negatively on large numbers of people in Region 1. Literature shows that the highest estimated numbers of people affected are, however, recorded in the years 2007 and 1998, accounting for 1,400,000 and 1,300,000 persons, respectively (Table 4-1).

Table 4-1: Major Zambezi floods since 1980 affecting Region 1

Year	Estimated number of persons affected in Zambia
1989	800,000
1998	1,300,000
2001	617,900
2004	196,398
2007	1,400,000
2009	614,814

Source: Based on data from the EMdat website¹⁷

In other later years, such as 2010, 2011, 2012 and 2013, localised extreme floods have also been recorded in Region 1 (OCHA, 2013). This signifies a more recurrent occurrence of floods in Region 1. With the associated impacts of crop failure and displacement of habitations that result from recurrent floods, the media and international agencies such as the United Nations Humanitarian Country Teams (HCTs) are responsive in supporting communities faced with disasters that they classify as effects of climate change (OCHA, 2013).

¹⁷This data source is also used in Zambia’s draft National Climate Change Response Strategy. <http://www.emdat.be/result-country-profile>

4.1.2 Extreme Droughts/ Dry Spell

Like floods, droughts have also been recorded in Zambia. For instance, the worst drought experienced in Zambia was in the 1992/1993 season, which affected the entire country and caused severe food shortages (Thompson, 1993). Subsequently, due to the large number of people left food insecure after the 1992/1993 droughts, food subsidies had to be introduced to the communities affected (Thompson, 1993). Other significant droughts recorded were in the 2000/2001, 2001/2002 and 2004/2005 rainy seasons (WaterAid, 2010; Lekprichakul, 2008). Other years, such as the 1993/1994 rainy season, have also been characterised by dry spells affecting parts of the country, especially areas in Agro-ecological Region 1 which receives less rainfall compared to Regions 2 and 3 (JICA/MEWD, 1995; MTENR, 2007).

According to MTENR (2007) and Thurlow et al., (2009), an increase in the occurrence of droughts and dry spells, in Region 1 and the Simalaha area, alongside with their intensity and magnitude is no longer debatable. Thurlow et al., (2009)'s study of droughts for the period of 1976-2006 revealed that in the 1990s and 2000s, droughts had become severe and more recurrent. The drought of 1991/1992 farming season was one of the most significant due to its impact on about 1,700,000 people in Region 1 alone (Thurlow et al., 2009). Equally, the impacts of the droughts were felt in other regions, and as such major interventions of providing relief food and support to affected people characterised outcomes of the event. Unlike previously, the severity and impacts posed by the droughts of 1991/1992 also prompted media talks to be more focused on natural disasters in Zambia (Funder et al., 2013). Other severe drought years were recorded in 1994/1995 and 2004/2005 farming seasons, impacting on about 1,273,204 and 1,200,000 people, respectively (Thurlow et al., 2009).

However, other years were characterised by less severe droughts, including those of 1993/1994 (Thurlow et al., 2009). Up until now, however, it cannot be affirmed whether or not the occurrence of short-term drought events has increased. Yet, literature exists showing droughts studied in the period of 1976 to 2006, in which severe droughts are classified to have occurred in the 1990s and 2000s (Thurlow et al., 2009).

The 2000s being characterised by floods and droughts in alternation or concurrency are significant for understanding risks posed to farming. In their argument, Thurlow et al., (2009) suggest that the occurrence of a severe drought or flood then has a 75-80% chance occurrence in any given year in Region 1 or Region 2 where as some years may experience both extreme droughts and floods as was the case in 2001/2002 rainy season. This occurrence is possible in downstream areas experiencing droughts whilst at the same times, rain water from the Northeast in the upstream areas moves towards the drought affected areas, downstream causing floods.

On the whole, rainfall deficits and periods of dryness are thus a common feature of Region 1, therefore, considered a drought prone area. In addition, Region 1 exhibits this greater variability and tendency towards a dryer climate because the Inter Tropical Convergence Zone (ITCZ) has a lower influence on rainfall in this region¹⁸.

4.1.3 Temperature Variations

In addition to extreme events of droughts and floods, gradual climatic changes in the temperature have been studied and documented. Decadal analyses of summer temperature made from 1997 to 2007 suggest that temperature in Zambia, Region 1 inclusive have increased by about 0.6 degrees Celsius (Jain, 2007). This estimate is ten times higher than increases predicted on average in the Southern African region. Predictions also suggest that temperature will continue to rise over time (Jain, 2007).

In these studies, major arguments point towards observed significant increases in maximum temperature. For instance, in her study, Lwando (2013) analysed maximum and minimum temperatures in Sesheke District and found that significant increases were noted in maximum temperature ($F = 5.38$, $p < 0.05$) over the 40 year period between 1969 and 2010. Results of her study also showed that with regards minimum temperatures, there were no significant changes observed in the 40 year period ($F = 0.06$, $p < 0.05$). Other studies have obtained similar results with regards temperature in the

¹⁸ Based on EM Data – data source also used in Zambia’s draft National Climate Change Response Strategy. <http://www.emdat.be/result-country-profile>

study area. For instance, Bwalya (2010) revealed that Zambia had recorded a 0.6°C temperature increase, by observing temperature changes over a period of time.

4.1.4 Rainfall Variations

Like the rest of the areas in Agro-ecological Region 1, the Simalaha area experiences rainfall of around 700mm to 800mm annually (JICA/MEWD, 1995). In the recent past however, studies show that the area has been experiencing a reduction and intermittent rainfall patterns. In their reports Siegel (2008) and de Wit (2006) observe that the periods starting 1970 to 2000 have seen decreases in annual rainfall for Region 1 in comparison to Regions 2 and 3. Similarly, Jain’s (2007) study of rainfall patterns in agro-ecological Region 1 shows irregularities over a 14 year period (from 1990 to 2004). Anomalies in rainfall patterns observed in the studies were more inclined to a reduced pattern occurring intermittently. For instance, from 1990/1991 to 2003/2004, all regions had recorded rainfall below average with Region 1 mostly affected by severe dry spells than the central region. Rainfall received in these periods was generally much lower than required amounts for crop production.

Further, comparisons of data conducted over a 30 year period of the mean, minimum and maximum rainfall among the three Regions show that lowest rainfall were recorded in Region 1 (Table 4-2).

Table 4-2: Comparison of mean, minimum and maximum rainfall among three agro-ecological Regions in Zambia over a 30 year period

Agro-ecological region	Mean annual precipitation (mm)	Highest precipitation in 30 years	Lowest precipitation in 30 years	Mean annual precipitation (mm)
Region 1	684	1048	428	684
Region 2	830	1205	544	830
Region 3	1151	1373	836	1151

Source: MTENR (2007)

Region 1 therefore continues to exhibit the lowest amounts in mean annual rainfall. It is also clear from Table 4-2 that Region 3 receives the highest rainfall, followed by Region

2. Region 1 is the least of the three regions. Thus, Region 1 is much more vulnerable to climate change and variability in comparison to Region 2 and 3.

Further, other studies show that the rainy seasons have become shorter since the 1980s (Kasali, 2008). Major arguments in this regard point to changes in the onset of rains from the usual October or early November to second or third week of November (Kasali, 2008). The preceding three seasons – 2013/2014, 2004/2005 and 2015/2016 however, have seen even much more delayed onset of the rains¹⁹. This implies that subsequent planting of crops is delayed in an already shortened window of time available for crops to grow and mature before the end of the farming season.

Other than studies shown in the preceding paragraphs, studies conducted on rainfall in Zambia have nonetheless shown inconclusive results. The situation is exacerbated by the late establishment of weather stations that could not show concrete rainfall data. Much of this information is available starting from the 1960s whereas earlier data is inadequate or unavailable. Still, studies shown in the earlier sections can be used to understand the rainfall scenario because they are among the most comprehensive studies done so far for the Region 1 where the Simalaha area is situated.

4.2 Local Perspectives of Climate Change in the Simalaha Area

The understanding of local perspectives on climate change is significant for this study. It has helped to understand how and why meso-level institutions with interests in supporting local adaptation to climate change devise response adaptation strategies. It has also helped to understand local people's perceptions of environmental changes currently going on in the Simalaha area and the associated risks and how they learn to adapt to changing situations.

In the Simalaha area, there have been on-going discourses among inhabitants and institutional actors of the understanding and effects of extreme climatic events (e.g. floods and droughts) and gradual changes (changing rainfall patterns) on agriculture and

¹⁹ Based on the 2015 food security early warning system agro-met update of the 2014/2015 agricultural season

general livelihood. According to in-depth interviews and workshops held with various government and NGO stakeholders in Kazungula and Sesheke districts, notable consensus, points to agreements that the environment has undergone changes overtime (Interviews, 2:1; 2:3; 2:10; 3:1; 3:2; 3:13; 4:1; 4:2)²⁰ (see Appendix 17 for details of respondents and interview codes). Disasters have also been observed and said to be recurrent now as opposed to the last two decades. The most observed disasters pertain to rainfall variations, drought episodes, recurrent floods and temperature variations (Interviews, 2:1; 2:3; 2:10; 4:1; 4:2). All these phenomena are seen by inhabitants to have a direct impact on livelihood because they all touch on people's sources of food and income. Droughts and floods, for instance impact negatively on agriculture and bring in uncertainties to crop produce during the crop season. A detailed account is provided in the following sections.

4.2.1 Extreme Floods

In the Simalaha area, floods have been a major feature of the area. Focus group discussions conducted with informants from Mwandu Central informed the meeting that flood occurrences could be traced back to 1978 (FGD, 1:1 – 13th April, 2014). The year 1978 is significantly remembered in the community as a great flood year because floods were experienced in extreme. Many households relocated from their home dwellings to upper lands in drier areas. In the subsequent years, floods of smaller magnitudes were noted in the area despite not causing much disruption to the social order. However, with the onset of heavy floods in the 1970s, people in the Simalaha area currently perceive that flood occurrences are now part of the biophysical nature of the area. Focus group interviews with local people of Mulombwe-Kasaya and Mwandu Central communities, established that major floods were also observed in the years 2002, 2006, 2007, 2008, 2009 and caused disruptions such as loss of homes and property (FGD: 1:5; 1:1). Figure 4-2 shows human habitation areas affected by some floods.

²⁰ This coding represents interviews and respondents interviewed using qualitative methods



Figure 4-2: Flooded areas in the Simalaha Plains

Some of these years are very significant for the study area because they saw the birth of major changes in habitations for people affected. The most pronounced change was the establishment of the Namapande Resettlement Scheme in Chief Sekute's area of Kazungula district. The resettlement area was born through government's efforts of trying to keep people from flood prone areas and is currently occupied by people previously displaced by floods from their home dwellings in the late 2000s.

"... because most people were living in an area prone to floods, we decided to look for land where we could relocate them ... so we asked for land from Chief Sekute. He allocated 10,000 hectares of land [in Namapande] and people were allocated plots in that area". – (In-depth interview, 2:1)

The household questionnaire survey also showed that interviewed households residing in the Simalaha area, had experienced some floods. Out of the 200 people interviewed, 74.5 percent of the respondents reported that they had observed floods in the Simalaha area, whereas only 25.5 percent of the respondents reported that they had not observed any floods in the study area (Figure 4-3).

Figure 4-3: Percentage of respondents to have observed floods in the study area

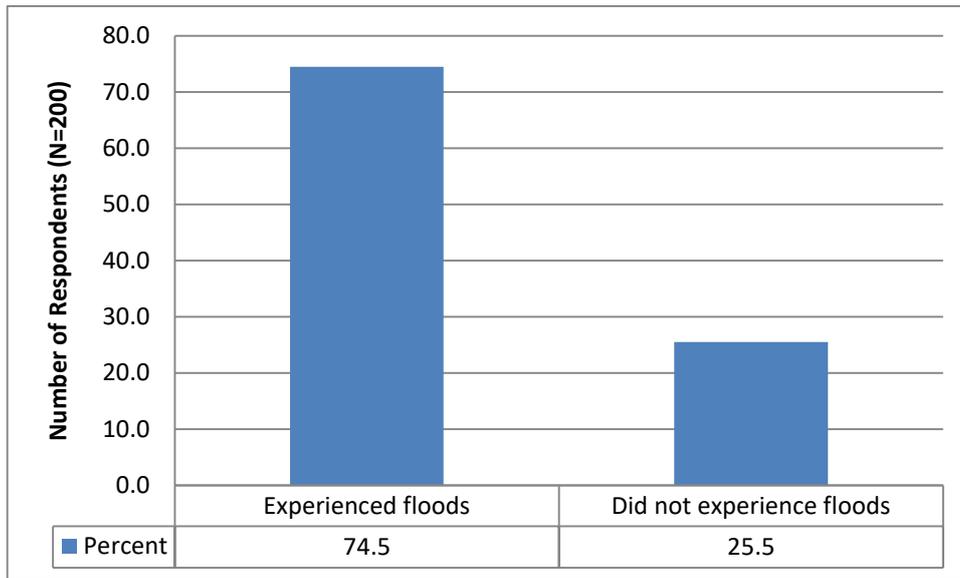


Figure 4-3 shows that $\frac{3}{4}$ of the people that reside in the Simalaha area identify their area with flooding. Further, the first workshop conducted with district officials in Kazungula district, suggest that floods mainly affected the low lying areas of Kasaya, Kansensa, Ngwezi and Sikaunzwe parts of the Simalaha area as shown Figure 4-4²¹. Moreover, the household questionnaire survey showed that all wards sampled for the survey got affected, by floods in one way or another as shown in Table 4-3, below.

²¹ Based on the report by the Zambia Team (2012); Workshop proceedings of the launch of the climate change project in Kazungula District (2012)

Figure 4-4: Identified locations with extreme floods from 2006 to 2010, in Kazungula Districts

GROUP B

<u>Events:</u>	<u>Locations</u>	<u>Period:</u>
① floods (severe)	Kasaya, Sikaunze, Kasenja, Kachabula, Mambova, Ngwezi-malo and ngwezi tank	2006-08
② Dry spells	Kazungula District	2010-12
③ frost (severe)	Along "	2011-12
④ Drying of streams	Luzila, Ngwezi, Sichifuto, Siankanga	2010-12
⑤ food insecurity ⑥ Salinity	Mandia area, Kasaya area, Katumbola area, sekute area, Mukuni area, Kasaya school	2010-12
<u>Impact:</u>		
① charcoal burning		
② Over fishing		
③ Migration of Species (Kudu, Buffalo, elephants)		
④ Occurrences of world fires		
⑤ food Insecurity		
⑥ Epidemic (animal diseases) (CBPP)		

Table 4-3: Areas most affected by floods in the Simalaha area

Ward	Community name	Frequency of flood experience
Sikaunze	Namapande	2
	Kawana	10
	Candela	0
	Bbilibisi	9
	Muteto	10
	Ngalata	0
Ngwezi	Kachabula	10
	Nalituwe	6
	Kenga	10
	Munambwe	10
	Sililo	10
	Maibwe	8
	Tomu-Muyambango	10
	Siankande	10
Mabumbu	Namangu	8
	Mulombwe/Kasaya	10
	Makanga	3
Mwandi	Mwandi-Central	8
	Sikuzu	8
	Sooka	7
Total		149

During the first consultative workshop, officials (local experts) from Kazungula district also pointed out that areas most affected by floods in the Simalaha area are traversed by seasonal rivers/streams such as the Ngwezi and Kasaya Rivers (Interview, 4:1). With the onset of short intense rainfall, which has become recurrent in the recent past, the local streams fill up quickly and overflow to proximal habitations causing extreme flooding. In addition, upland rain water from the north, finds its way in the low lands causing flooding in the Simalaha area.

In the wetlands where the soils are predominantly gleysols or clay soils (Figure 4-5), underground water saturates for longer periods of time (Tembo, 2014) also causing flooding because rain water fails to percolate through, hence flows uncontrollably.

Figure 4-5: Gleysols of the Simalaha area

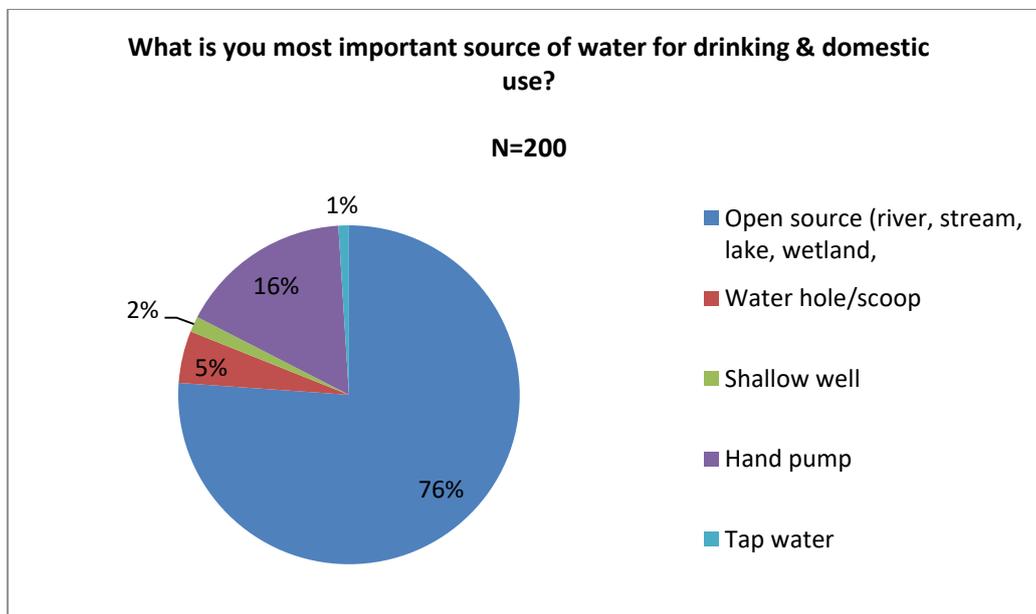


Therefore, based on perceptions of the people of the Simalaha area, and officials working in Kazungula and Sesheke districts, it is clear that flooding is a major characteristic of the Simalaha area (Interviews, 2:1, 2:3, 2:10, 4:1, 4:2). Associated impacts resulting from floods affect major social aspects such as health, agriculture, education, water, sanitation and housing (Mwape, 2009). The subsequent sections briefly discuss livelihood impacts of floods felt in the Simalaha area.

4.2.2 Livelihood Impacts of floods

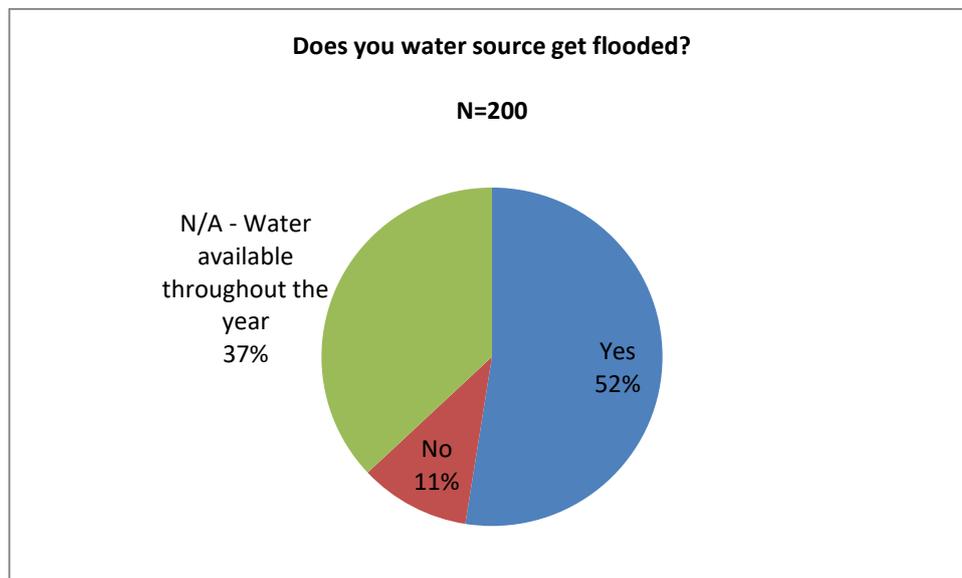
Open water sources and shallow wells are an important source of domestic water used in the Simalaha areas (Figure 4-6). With frequent flood occurrences, however, the water sources equally get flooded (Figure 4-7) and are prone to contamination due to constant exposure of the water resource to polluted substances that come along with flood water. Flooding also causes collapsing of pit latrines commonly used in the Simalaha area, which too can contribute to contaminating open water sources if not well managed, and thus contributing to water-borne diseases.

Figure 4-6: Most important source of water for drinking and domestic uses



Moreover, due to high collapsing rates of pit latrines in the study area, the majority of inhabitants of the Simalaha area do not construct toilet facilities to avoid wasting resources and time, in the event that the facilities collapse. Sandy soils on the western side of the study area have also contributed to people's failure to construct toilet facilities because the collapsing rate of the toilet facilities is quite high. This implies that households have to rely on the bush for defecation. With constant floods noted in the 2000s, i.e. 2002, 2006, 2007, 2008, 2009, faecal material finds its way in open sources of water used for drinking, further contaminating primary sources of water used for drinking.

Figure 4-7: Percent of respondents that mentioned that their water sources got flooded in the 2000s



Other associated impacts of floods relate to complete or near destruction of crops, infrastructure and food storage facilities. Storage facilities for food crops are prone to submergence or getting washed away resulting in total loss of sources of nourishments. Equally, flooding of crop fields reduces crop productivity when crops begin to die down from getting water logged. Figure 4-8 shows a maize field with stunted crops resulting from the field previously water logged as a consequence of floods.

Figure 4-8: Failed maize field due to flooding in the Simalaha area



Floods also cause major displacements of people from usual home dwellings. For instance, in both 2006 and 2008, people in the Kasaya, Ngwezi and parts of Mwandu locations were displaced from their home dwellings following extreme floods that hit their locations. According to the District Administrative Officer for Kazungula, affected households had to seek temporary refuge at the District Commissioners office in Kazungula prior to finding a lasting solution (Interview, 2:1). As discussed in the earlier sections, the current situation is that, some affected households have been permanently relocated from their usual dwelling to the new resettlement area called Namapande. However, while the newly resettled land has offered people of opportunities to farm on large scale and receive government support in their adaptation process, the relocating process itself has had its own downside. For instance, people that relied on fishing activities as a major economic activity in the Simalaha area have failed to adapt to the new life of farming in Namapande, because the area is not traversed by any river. As a consequence, some fishermen have opted to maintain two homes – one in the dry Namapande and the other in the flood prone area of the Kasaya area, further putting a strain on their resources.

In addition to the above mentioned impacts, other impacts caused by floods include:

- high reliance on natural resources for food due to losses in crop produce
- death by drowning
- disruption of the accessibility and delivery of health services
- disruptions of the accessibility to schools for school going children

4.2.3 Benefits of Floods

In the Simalaha area, however, floods are not seen to be all negative especially if the negative impacts outweigh the benefits. For instance, people owning land in flood prone areas have seen opportunities of benefiting from flood waters collecting within their farms. Areas that get flooded and only with required amounts of flood waters are now used for rice production (Figure 4-9).

Figure 4-9: Rice growing in the Simalaha area

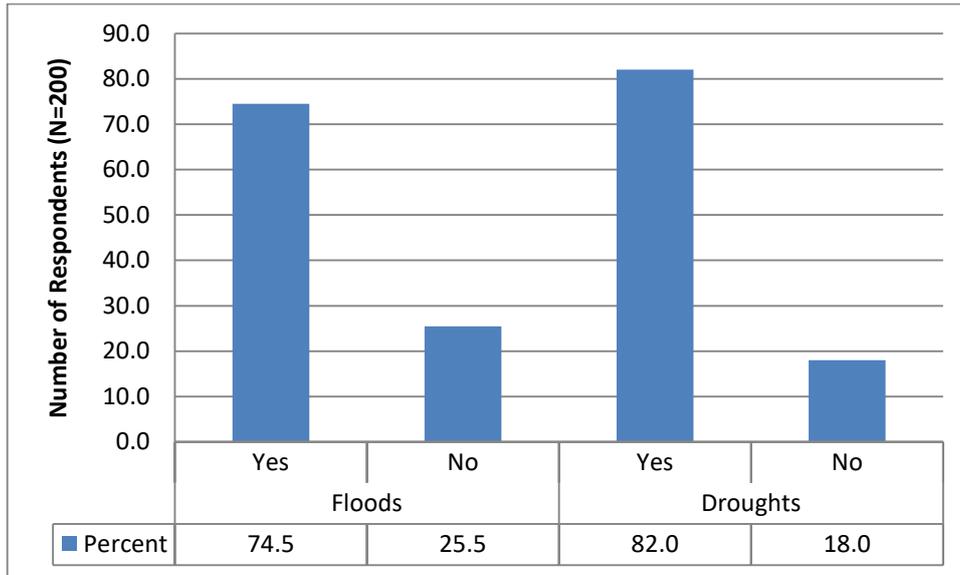


While rice growing is common in the Provincial Capital of western province and areas up in the north-west, this practice has also been recommended by district officers for use in areas of the Simalaha where maize production is becoming lesser and lesser (Interview, 2:4). In addition, when flood water recede, residual matter that can offer nourishment to the soil is deposited (DMMU, 2010) which is also used for vegetable growing in dump fields called “*Litapa*”.

4.2.4 Extreme Droughts

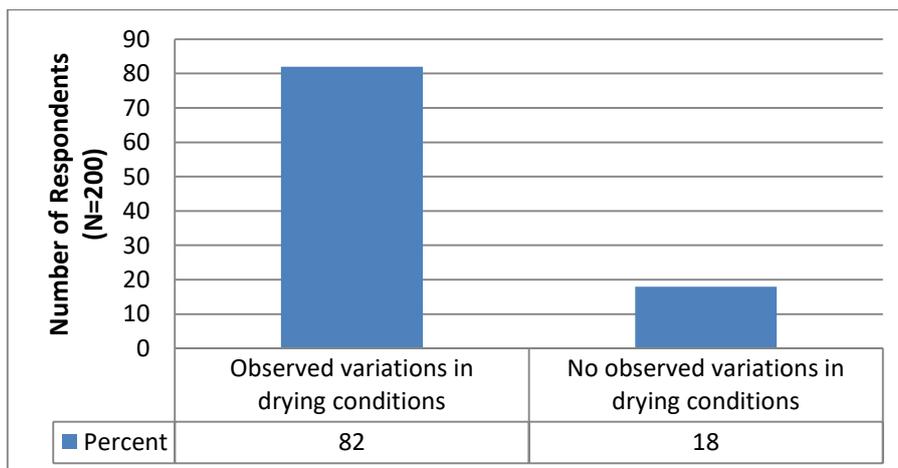
Interviews conducted with officials in Kazungula and Sesheke during consultative workshops have also revealed that the occurrence of drought and floods within the same year is a phenomenon they have encountered (Interviews, 4:1; 4:2). Similarly, observations made during field work of the household questionnaire interviews are in accord with the general vulnerability context of Region 1, which shows almost an equal chance of flood and drought occurrence recorded in the same given years in the study area (Figure 4-10).

Figure 4-10: Experiences of floods and droughts in the same given years in the study area



Nonetheless, investigations of drought conditions for the Simalaha area alone show similar results as perceived by locals. Investigations conducted on households through a household questionnaire survey on people’s perceptions of whether or not they had experienced droughts or dry spells shows that 82 percent of the 200 interviewed households reported that they had experienced years of extreme droughts, since they resided in the study area. Only 18 percent of the interviewed households disputed to having observed drought conditions in the study area (Figure 4-11).

Figure 4-11: People’s perceptions of droughts or dry spells since residing in the study area



Similar observations of increased prevalence of drought conditions in the study area were made by technocrats during the first consultative meetings in which various environmental changes and climatic events that had occurred in the study area were noted. Figure 4-12 shows some of the responses provided with respect to climatic events including droughts experienced in Sesheke and their duration.

Figure 4-12: Meso-level institutions' perceptions of climatic events experienced in Sesheke District

GROUP B

EXAMP

EVENTS	LOCATION	PERIOD
1. FLOODS	KASATA, SIKWIZH, SIMAWEWE KATOBELWA, LUMBE, IMUSTO KAPALI	2007 - 2010 2010
2. DROUGHTS	WHOLE DISTRICT MORE IN NAWANDA & LUMPUYU WARDS	2005 - DATE
3. EXTREME TEMP. (-4 → 41°C)	FROST (WHOLE DISTRICT) HIGH TEMP (WHOLE DISTRICT)	→ 2011 - DATE → 2005, 2007, 2011
4. EPIDEMICS	LIVESTOCK (ALONG ZAMBEZI, LUMBE & ITOKO) CROPS (WHOLE DISTRICT) HUMAN (NAWANDA, SIKWIZH)	2007 - 2010 2007 - 2010 2007 - 2011

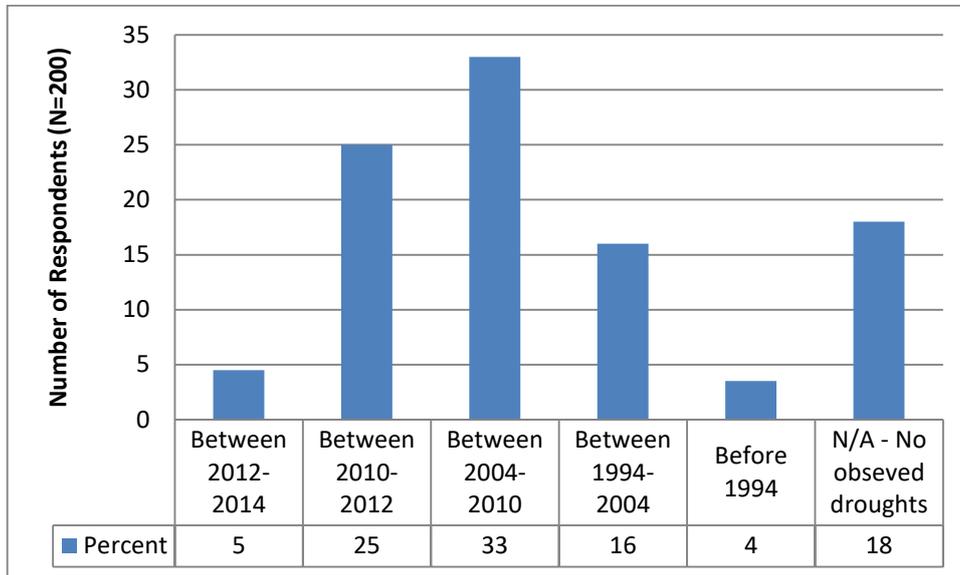
Further, interviews with officials from Kazungula and Sesheke Districts pointed to experiences of droughts and floods, sometimes occurring concurrently (Interviews, 4:1 and 4:2), which best characterises the climatic profile of Region 1²².

Further investigations of the household questionnaire survey sought to understand actual periods of observed droughts in the study area. Of the 82 percent that observed drought conditions in the study area, 33 percent of the respondents reported that their observation of drought conditions started from 2004 to 2010 where as 25 percent reported that they started observing drought conditions from 2010 to 2012. Sixteen (16) percent and 4 percent reported that they started observing drought conditions from 1994 to 2004 and

²² Based on the Biophysical Context paper on climate change events in Kazungula and Sesheke district (2013)

before 1994, respectively. Only 5 percent of the respondents cited that they started observing variations around 2012 to 2014 (Figure 4-13).

Figure 4-13: Periods of perceived droughts and/or dry spells in the study area

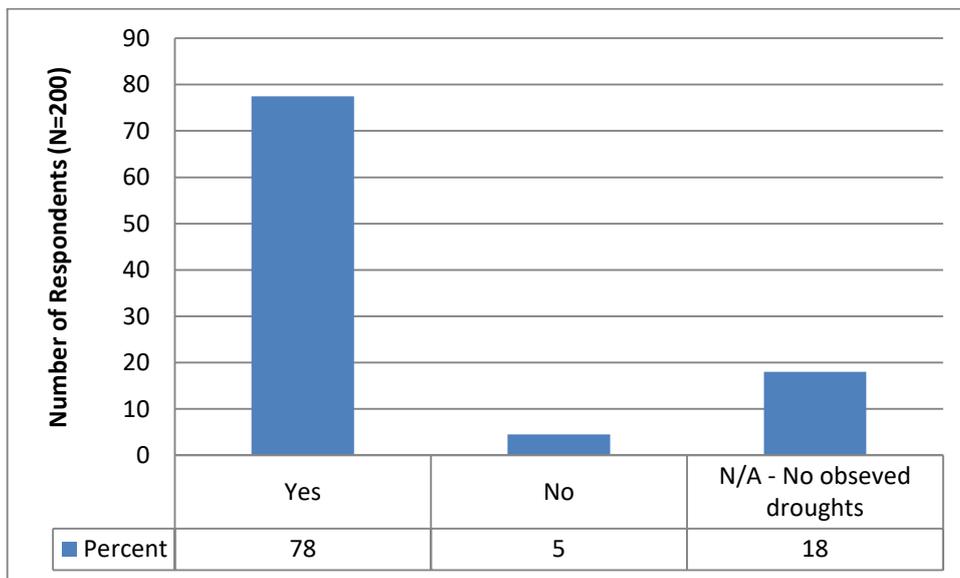


As can be seen from the results of the household survey, there is no doubt that droughts had been observed by respondents. Further, the majority of the respondents had observed droughts between the period 5 to 20 years. This result fits well with Thurlow et al., (2009)’s study where extreme droughts were in their extreme from the 1980s to 2000s.

Despite the small percentage of the people to have cited that they started observing droughts since 2012, the study is also mindful of the few people with such observations. This is logical putting into consideration the younger generation of the respondents that participated in the questionnaire survey. Moreover, due to continuous migration, it is not easy to know of events that may have occurred prior to current settlements among respondents. This understanding is also important because it sheds more light on variations of responses shown as to what people’s perceptions of drought timeframe, currently are.

Further, results from the household survey showed that trends with respect to observed variations were tailored towards increased frequency of dry spells, especially in the recent past. Of the 82 percent respondents that affirmed to have experienced droughts in the study area, 78 percent (or 156 respondents) also reported that they observed an increase in the occurrence of the droughts and dry spells (Figure 4-14). Only 5 percent of the respondents did not think drought/ dry spells had increased in the recent past.

Figure 4-14: Perceptions of observed variations of increased dry spells



Comparing field results obtained from local perceptions with findings made by Thurlow et al., (2009) on Agro-ecological Region 1, people’s perceptions of increased drought tendencies have been found to be in accord with scientific observations made on the area.

4.2.5 Livelihood Impacts of Droughts

Drought conditions in an area have a number of livelihood impacts. The major resultant consequence for increased drought conditions is continued crop failure which leads to food insecurity as evidenced by the findings of the focus group discussions (FGD: 1.1 – 13th April, 2014) and consultative workshops (4:1, 4:2) (Figure 4-15).

“...impacts include food shortages, severe famine, and increased sicknesses due to poor nutrition, malnutrition in children, reduced grazing

pastures and livestock dying from hunger". – (Focus Group Discussions, 1:1)

Figure 4-15: Some of the livelihood impacts of droughts

GROUP B

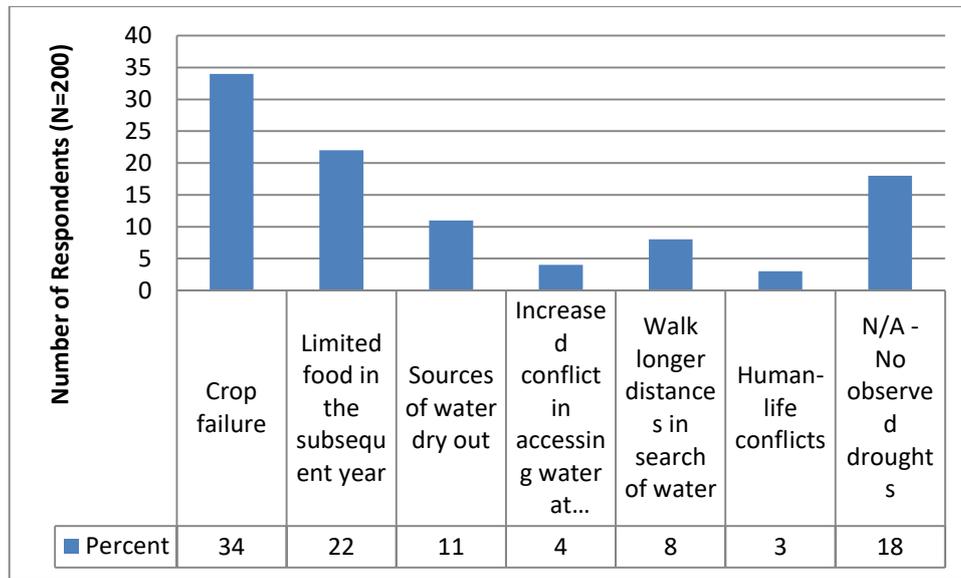
<u>Events:</u>	<u>Locations</u>	<u>Period:</u>
① floods (severe)	Kasapa, Sikaunzwe, Kasenja, Kachabula, Mahubwa, Ngwezzi-malo and ngwezzi tank	2006-08
② Dry spells	Kazungula District	2010-12
③ frost (severe)	Along "	2011-12
④ Drying of streams	Luzita, ngwezzi, Sichifuto, Sianakanga	2010-12
⑤ food insecurity ⑥ Salinity	Mandia area, Kasapa area, Katombola area, sekute area, Mukuni area, Kasapa school	2010-12

Impact:

- ① charcoal burning
- ② Over fishing
- ③ Migration of species (Kudu, Buffalo, elephants)
- ④ Occurrences of world fires
- ⑤ food Insecurity
- ⑥ Epidemic (animal diseases) (CEPP)

As observed by informants from the 1st stakeholder workshops held in Kazungula and Sesheke districts, the household questionnaire survey found similar results. Results show that, among the respondents to have experienced drought conditions in the study areas, 34 percent of them reported that droughts were problematic because they brought about crop failure (Figure 4-16). Other problems noted to be brought about by droughts were food insecurities (accounting for 22 percent of the responses), drying up of water sources and increased conflicts in accessing water at few public water sources with water, accounting for 11 and 4 percent of the responses, respectively (Figure 4-16).

Figure 4-16: Perceived problems of increased drying conditions



As evidenced from the informants’ perceptions during the study, drought conditions have far-reaching consequences on general livelihood in the study area. Economically, people’s sources of income are disrupted because the economy for the rural poor in Zambia thrives through agricultural productivity (CSO, 2014). In the event of crop failure due to drought or dry spells, people not only lose food for consumption, but also incur losses on investments made toward farming. Earnings from agricultural produce, which in most cases is the mainstay for these rural economies, are lessened. Moreover, district officials from Kazungula and Sesheke districts explained that the other key contributor of livestock production, to the economic standing of people in the Simalaha area plummeted following the occurrence of livestock diseases such as Contagious Bovine Plural Pneumonia (CBPP) and foot and mouth diseases that cropped large numbers of cattle (Interviews, 2:1; 2:2; 3:1; 3:4; 4:1; 4:2). This has further put a strain on sources of livelihood for the people.

Furthermore, Region 1, in comparison to Region 2 and 3, is vulnerable to interim droughts and reduced rainfall and rainfall variability (Thurlow et al., 2009) because it is generally dry and semi-arid. District officials working in Kazungula and Sesheke districts pointed out that the arid nature of the region has implications on the sustenance of open

water sources such as streams, which in most cases dry out (Figure 4-17) in later periods of the year (Interviews, 2:4; 2:8; 3:1; 3:4). Moreover, regional rivers and streams that drain the Simalaha area depend on water supplies fed by rains upland, particularly in the northern regions, subsequently, incapacitating access opportunities in times of shortages. In addition, other areas depend on ground water sources, such as boreholes and wells for domestic water uses. Unfortunately, existing groundwater sources lack adequate and developed technologies to improve domestic water access especially for rural communities (Chongo, 2011) in the Simalaha area.

Figure 4-17: Ngwezi river drying out in the dry season



Other than reducing crop productivity, the other downside effects of droughts are seen in inadequate water recharge and lowering of the water levels both surface and groundwater sources (WaterAid, 2010). This study has shown that some sources used for drinking dried up (Figure 4-17 and Figure 4-18) and in some instances, increased conflicts were observed at fewer available water sources due to congestion and competing over the limited water resources among users (Interviews, 4:1; 4:2).

Figure 4-18: Dried up stream used for productive and domestic



In addition, there are accumulated impacts of droughts that relate to the destruction caused to the environment. When a drought occurs, livelihood opportunities for people are lessened. For instance, when incomes that could be realised from the sales of crop produce are lost, the resultant situation is to heavily depend on the environment for survival. In Sesheke and Kazungula Districts, it was reported that excessive cutting down of trees for charcoal and log sales was used as an alternative livelihood activity engaged in by many to make extra incomes.

“...people lost primary sources of income because they could no longer grow crops [due to droughts] and they lost their animals due to diseases [such as CBPP and foot and mouth] so they started cutting down trees as an alternative means of survival ... As a result, the forests are now depleted because charcoal production for sale has increased”. (In-depth interview, 2:11)

Unfortunately, this venture was also entered into by unlicensed individuals who cut trees indiscriminately. As a result, most areas have been highly deforested exposing the land to soil erosion and nutrient depletion. Figure 4-19 shows some of the activities related to the cutting of trees and the impacts caused on the environment in some forest areas of the Simalaha area.

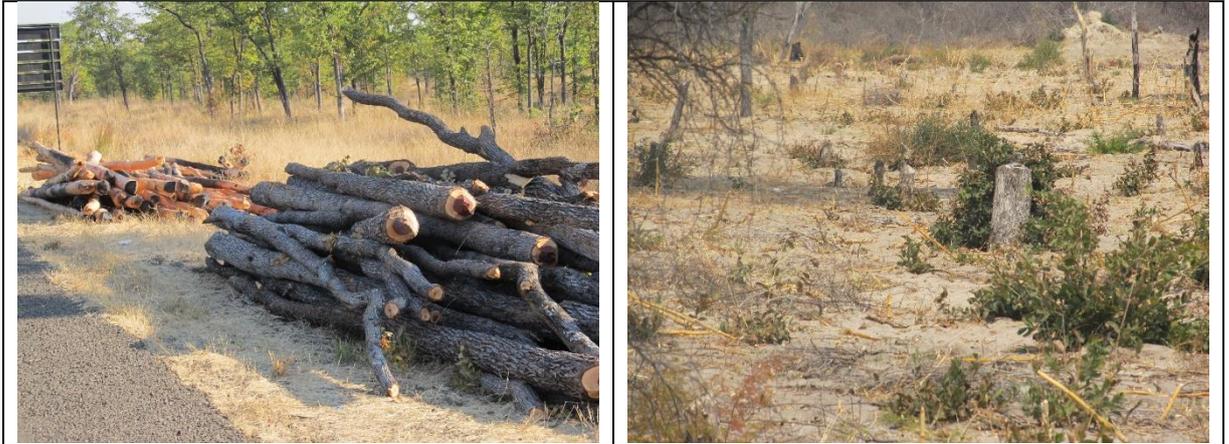
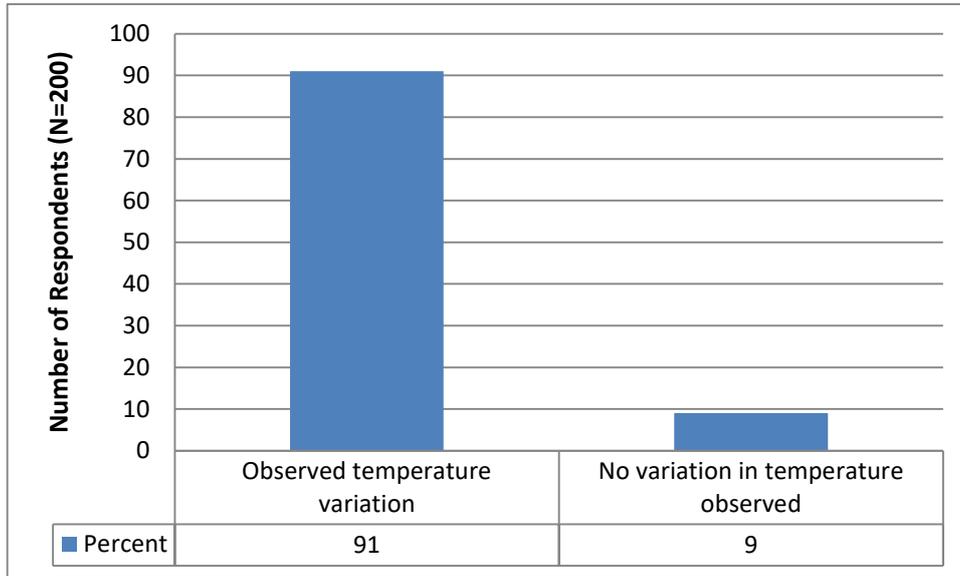


Figure 4-19: Cutting down of trees and the desertification resultant effects

4.2.6 Temperature Variation

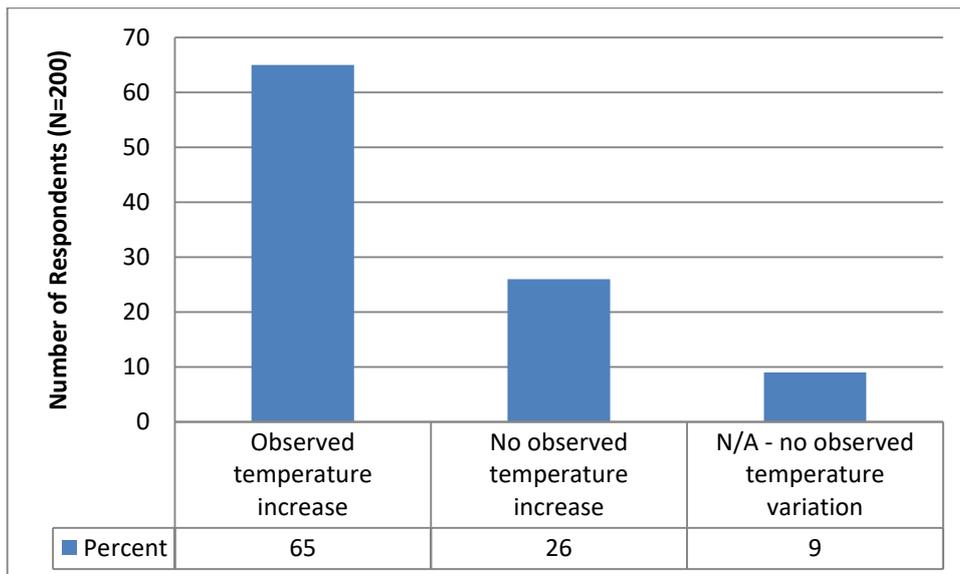
With regards assessments made in the study area, the household questionnaire survey showed that 91 percent (or 182 of the respondents) reported that they had observed variations with regards the temperature whereas only 9 percent (or 18 respondents) disputed to having observed variations in the temperature (Figure 4-20).

Figure 4-20: Perceived temperature variations in the study area



Whilst results show that many people had experienced variations in the temperature, differences were further noted on whether variations observed were with regards increases or decreases in temperature within the study area. Results show that the majority of the respondents accounting for 65 percent of the responses observed variations of increased temperature (Figure 4-21).

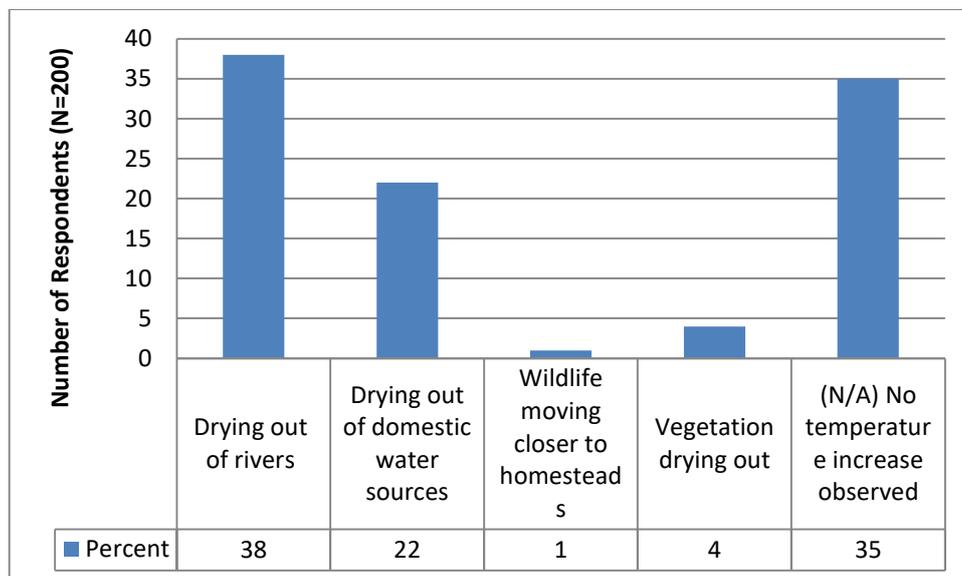
Figure 4-21: Perceived variations of temperature increases



As can be seen from people’s perceptions in the study area, the most observed temperature changes in the Simalaha area was with regards increased temperature over the years. Indeed, these findings are in accord with general observations made by various authors such as Bwalya (2010) and Lwando (2013). In their studies of the Region 1, Bwalya (2010) and Lwando (2013) found that temperature had increased overtime.

In the Simalaha area, however, scientific technologies are not available for use among inhabitants to analyse or measure the extent to which temperature had increased or decreased. However, certain benchmarks are used based on cognitive understanding of historical and current local contexts. Understanding that temperature has increased over the years is done by observing related impacts brought about by extreme temperature increase such as drying up of rivers and the drying out of domestic water sources, over time, accounting for 38 and 22 percent of the responses, respectively (Figure 4-22).

Figure 4-22: Local indicators used to measure perceived temperature increases



Other indicators used by local people were with respect to the level with which vegetation was drying up as well as wildlife moving closer to people’s homestead in search of water due to the drying out of water sources in the forests, accounting for 4 and 1 percent of the responses, respectively.

However, in addition to increases in temperature, consultative workshop findings with District officials pointed to trends of momentous decreases in temperature conditions particularly in Sesheke where frost conditions dropped temperatures to as low as minus 4°C as shown in Figure 4-23 (Interview, 4:2). This shows that temperature oscillates on a continuum of extremes – both hot and cold and in the summer and winter, respectively.

Figure 4-23: Extreme temperatures perceived by institutional actors in the study area

GROUP B

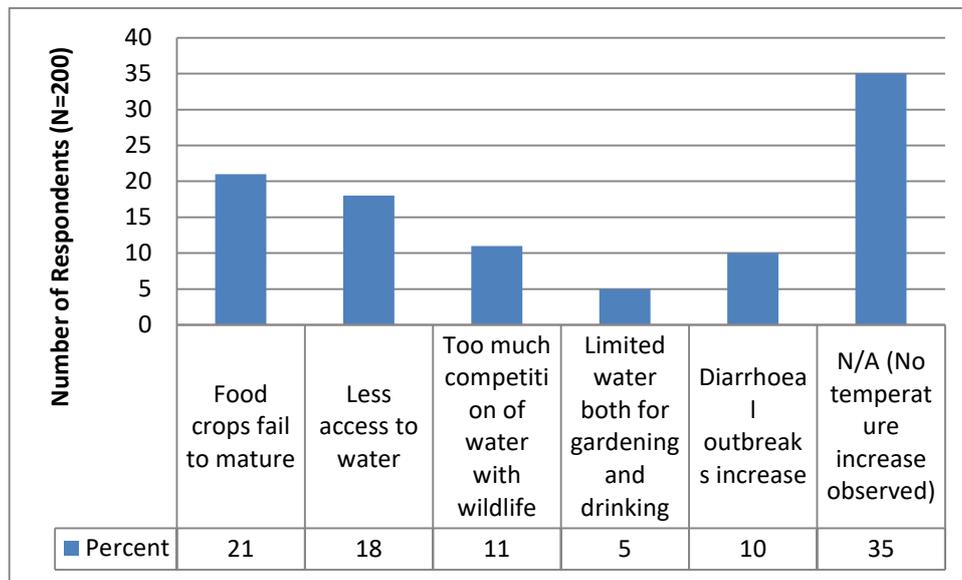
EXAMP

EVENTS	LOCATION	PERIOD
1. FLOODS	KASATA, SIKUTU, SIMAWEWE KALOBOLEWA, LUMBE, IMUSTIC KATAU.	2007 - 2010 2010
2. DROUGHTS	WHOLE DISTRICT MORE IN NAWANWA & LUMPUKUYI WARDS	2005 - DATE -
3. EXTREME TEMP. (-4 → 41°C)	FROST (WHOLE DISTRICT) HRAH TEMP (WHOLE DISTRICT)	→ 2011 - DATE → 2005, 2007, 2011
4. EPIDEMICS	LIVESTOCK (ALONG ZAMBESI, LUMBE & STIKU) CROPS (WHOLE DISTRICT) HUMAN (MUNDA, SIKHILLI)	2007 - 2010 2007 - 2010 2007 - 2011

4.2.7 Livelihood Impacts of Increased Temperature Conditions

Like droughts and floods, temperature increase has been perceived to have some livelihood impacts by respondents and informants in the study area. The household questionnaire survey of 200 respondents revealed that the most significant impacts that resulted from temperature increase was the failure of crops to mature due to wilting of crops (accounting for 21 percent of the responses) (Figure 4-24).

Figure 4-24 : Kind of problems perceived to be a result of temperature increases



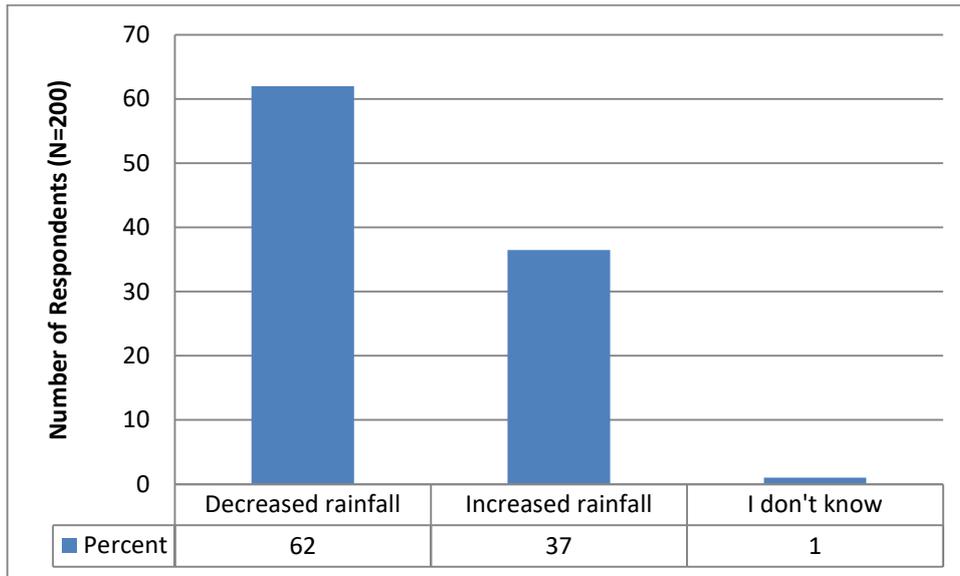
Other livelihood impacts related to the reduced amounts of water for productive and domestic uses, and constant competition for water in open sources between people and wildlife. Further, the focus group discussions held with community members of Mulombwe-Kasaya revealed that temperature increases reduced opportunities for preserving food and created general health issues (Interview, 1:5) For instance; leftover food went bad within a shortest possible time when temperatures were high. Hot temperatures were also said to be responsible for promoting favourable environments for bacteria to develop that was responsible for diarrhoeal diseases in the Simalaha area (Interviews 1:3; 1:5).

4.2.8 Rainfall Variation

During the household questionnaire survey, communities of the Simalaha area were asked for their perceptions regarding rainfall variation in the study area housed in the Agro-ecological Region 1. Of the 200 research participants interviewed, the assessment revealed that all respondents (accounting for 100% responses) attested to having experienced rainfall variations in the study area. However, discrepancies were observed of the kinds of rainfall variations observed with the majority of respondents perceiving an increasing trend towards reduced rainfall patterns as opposed to increased rainfall over the years (Figure 4-25).

Of the 200 households interviewed, 62 percent (or 124 of the respondents) attested to having observed decreased rainfall conditions over a period of time particularly in the recent past, whereas only 37 percent (74 respondents) reported that they observed a trend of increasing rainfall over the years (Figure 4-25).

Figure 4-25: Perceived rainfall variations in the study area

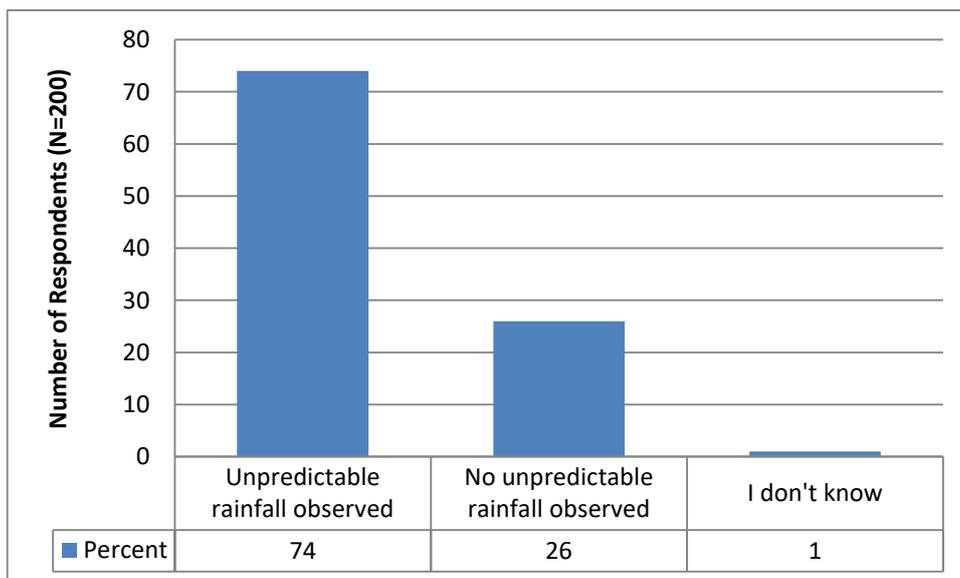


In addition to views of the household questionnaire survey of decreasing rainfall patterns, the 1st consultative meetings and in-depth interviews held with institutional actors revealed that there had been a decrease in the amount of rainfall received in the study area in the last 1 to 2 decades (interviews, 4:1; 4:2; 2:10).

“...Rainfall is no longer the same ... Amounts of rains received are much less now compared in 20 years ago. [In fact] rainfall is now most varying compared to temperature. [But] It is also easy to talk about variations on rainfall than temperature because ... impacts in reduced rainfall are seen more easily in terms of less food production and hunger compared to temperature which can not cause any direct impact to livelihood”. (In-depth Interview, 2:10)

Further, in addition to decreases and increases in rainfall variations assessed, unpredictability of rainfall in the study area which most research participants indicated to be a growing concern was assessed. Of the 200 households interviewed 74 percent of the respondents cited that they observed unpredictable rainfall conditions over the years whereas only 26 percent of the respondents reported that they had not observed any unpredictable rainfall patterns in the study area (Figure 4-26). The unpredictability of rainfall patterns was more inclined to experiencing extremely heavy rainfall within a shortest period in the rainy season whilst the rest of the season, they experienced dry spells. Other unpredictability of rainfall patterns were with regards the variations in the onset of rainfall and uncertainties of when the rainy season would come to an end. This observation is significant for food security because it challenges people’s knowledge of planning effectively for farming purposes.

Figure 4-26: Perceived unpredictable rainfall conditions in the study area



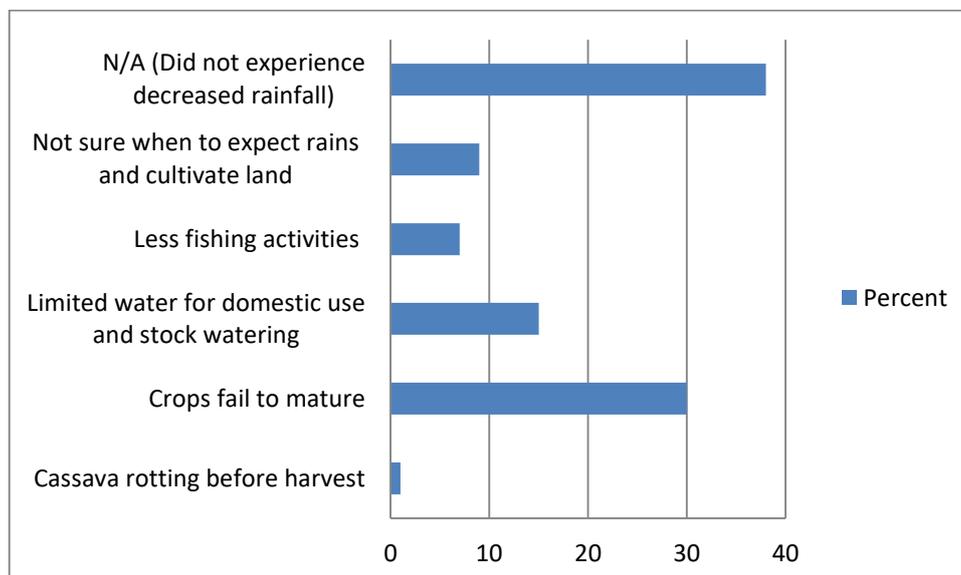
Perceptions made by interviewed people in the Simalaha area also reflect some of the scientific findings made in Region 1 on the unpredictable nature of rainfall patterns. For instance, MTENR (2007) and Lwando (2013) have revealed that rainfall has been unpredictable. The last few years have been characterised with unpredictable rainfall patterns (with some years experiencing less than required where as other years experienced more than required amounts of rainfall). These unpredictable rainfall

patterns have had subdued implications on agriculture and general livelihood. The unpredictable nature of the rainfall patterns also makes rivers in the study area prone to flooding especially in years of extreme rainfall.

4.2.9 Livelihood Impacts of Unpredictable and Reduced amounts of Rainfall

As concluded by Jain (2007), during the period of the 1990s, reduced amounts of rainfall had negative impacts on agriculture productivity. Even today, crop production is heavily depended on rainfall to thrive. Perceptions among informants suggest that with reduced amounts of rainfall, poor crop produce is the outcome which is seen as manifestations of long-term climate change. This implies that many people with livelihood economic activities dependant on rain fed agriculture derive fewer benefits from reduced amounts of rainfall. This result is also shown from the results of the household questionnaire survey. Out of the 200 people interviewed, 30 percent of the responses show that decreases in rainfall is less beneficial because it brings about crop failure during farming seasons (Figure 4-27).

Figure 4-27: Perceived impacts of reduced rainfall patterns



Crop failure, comes out as a significant impact of reduced amounts of rainfall, mentioned among the respondents because it directly takes away people's sources of livelihood. As mentioned by one of the key informants in Livingstone:

“Unlike temperature which does not show direct impacts on livelihoods, reduced amounts of rainfall directly affect people because hunger is immediately felt when crops fail. Tonga traditional customs such as offering visitors with ‘Chibwantu’, [the Tonga traditional drink made of maize meal] have died down in the recent past because maize production is no longer yielding much benefits as previously and now people cannot afford to part away with the little they have”. (In-depth interview, 5:1)

From the analysis of people's perceptions, it can already be seen that whilst reduced amounts of rainfall potentially reduce people's sources of nourishment and livelihoods, it has also begun eroding traditional customs among people that have been practiced over a period of time, because such practices are now costly and no longer sustainable.

Other perceived impacts of reduced rainfall relates to limited supply of water from various sources of water for drinking, domestic uses and stock watering in the subsequent year or months, accounting for 15 percent of the responses (Figure 4-27). Further, other perceptions cited included uncertainties of when to expect rains in preparation for cultivating land (10 percent) and less fishing activities due to reduced fish stocks (7 percent) (Figure 4-27 above).

Figure 4-28, shows a maize field that performed poorly as a result of reduced amounts of rainfall required to bring the crop to full maturity.

Figure 4-28: Failed maize production due to insufficient rains



Similar sentiments regarding unfavourable conditions brought about by inadequate supply of rainfall echoed by Bates et al., (2008) were also perceived by respondents during the study. While the questionnaire based study showed that reduced amounts of rainfall in the study area, implied that communities would have insufficient water for stock and domestic uses, Bates et al., (2008)'s study confirmed that in the absence of adequate amounts of rainfall or in water stress areas, people and the ecosystems' access is hampered posing high vulnerabilities to decreasing and more variable precipitations.

4.3 Conclusions

The study has shown that both science and local perspective acknowledge the existence of changes in the climate. However evidence from science has shown that some of the changes experienced are as a result of climate change. The occurrence of floods, droughts, temperature increases and rainfall variations all show that they have brought about associated impacts which affect livelihoods in general. The most resultant impacts of droughts, floods and reduced rainfall patterns pertain to severe food insecurities. This touches on the majority of lives in the Simalaha area because the majority of the people are crop farmers.

CHAPTER 5

LOCAL ADAPTATION PRACTICES ADDRESSING CLIMATE CHANGE

5. Introduction

This Chapter answers the first research question which is, “What are local people’s climate change adaptation practices?” To answer this question, household surveys and focus group discussions were used to obtain responses.

5.1 Local Adaptation Measures used in Response to the Impacts of Droughts

One challenge brought about by droughts in the Simalaha area was increased drying up of primary water sources. As a response to droughts, it was reported during focus group discussions held in Kawana and Siankande that digging up of scoop holes was one intervention developed to access water by households affected by dried up water sources (Interviews, 1:2, 1:3). Figure 5-1, exemplifies measures put in place by people with no proper access to water or those with limited water access.

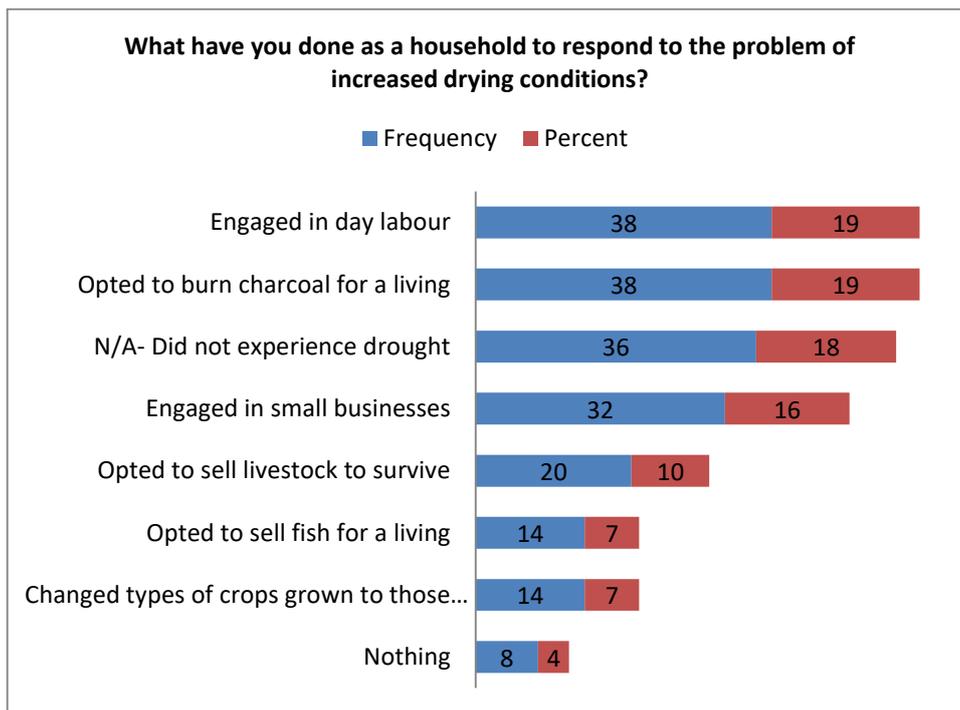


For people with large numbers of cattle, the focus group discussions reported that there were tendencies among pastoralists to move cattle to big rivers when local ones dried out to access water for stock watering (Interviews, 1:1, 1:2, 1:3). According to Agrawal (2008), this intervention supports the practice of mobility as an adaptation strategy. The challenge with this type of adaptation is that some pastoral farmers have lost their cattle along the way through theft by some cattle rustlers (Interview, 1:1), because security of

livestock is compromised when moved to faraway places from home dwellings to access water.

Furthermore, the household questionnaire survey revealed that, in response to challenges brought about by dry spells and drying conditions, the majority of the respondents started engaging in day labour to survive and opted to burn charcoal for a living, as is the case in other developing countries (Morton, 2007). This accounted for 38 responses (19 percent) (Figure 5-2). Other major activities people engaged in included engaging in small businesses and selling livestock to survive, accounting for 32 responses (16 percent) and 10 percent of the responses, respectively. Yet still, some households may engage in more than one form of adaptation measure in response to droughts or dry spells.

Figure 5-2: Strategies in response to dry spell or drying conditions



Looking for employment such as “day labour” or “piece work²³”, to earn incomes especially among people with no alternative livelihood opportunities is common in the

²³ Day labour is commonly known as piece work in Zambia

Simalaha area. For instance, some people work for renowned fishermen to assist in catching fish to earn small wages or to be paid in kind of fish equivalent. In some cases, in-kind payments are in form of favours where workers are given opportunities to use boats and fishing nets to catch their own fish after they have completed the work tasks for the employers (Interview, 3:14).

Others engage in charcoal burning and production activities to earn incomes when crops fail as a result of droughts (Figure 5-3).

Figure 5-3: An example of charcoal production in the Simalaha area



Continued droughts and poor rainfall in the Simalaha area has increased people's reliance on trees to make charcoal for economic gains. During a focus group discussion in Siankande Community, one female respondent reported that:

"...we do not see any other means of surviving other than depending on charcoal burning to earn a living. Since the rains are poor and our crops are performing poorly, we can't just sit and watch our children die of hunger. We have to make charcoal for sale to survive". – (Focus group discussion, 1:3)

With many people diversifying from crop farming to cutting down trees for charcoal production, this poses a big threat to environmental degradation and reduced control of greenhouse gas emissions. Communities may be trying to solve hunger problems by using charcoal as an alternative livelihood activity, but other problems are recreated which have adverse impacts on the environment and also for future generations. For instance, cutting down trees may excessively reduce mitigation of greenhouse gases especially that trees act as carbon sinks²⁴ for carbon dioxide emitted into the atmosphere.

Nonetheless, there are efforts from the Forestry department to replant trees under the “*woodlot programme*”²⁵ campaign, through schools and willing farmers that have given themselves to assist in improving tree population in the Simalaha area (Figure 5-4). Some areas have also been set apart as forest reserves where no tree cutting is permitted. However, that has not stopped people from encroaching on the forest reserve thereby causing intensified conflicts between the Forestry Department and the communities over the forest reserves (Interview, 5:3).



Figure 5-4: Tree planting activities to increase tree population

²⁴ Carbon sink is a natural or artificial reservoir that accumulates and stores some carbon-containing chemical compound for an indefinite period

²⁵ Woodlot tree planting programme is a programme supported and implemented by the Forestry Department to increase the tree population in Zambia

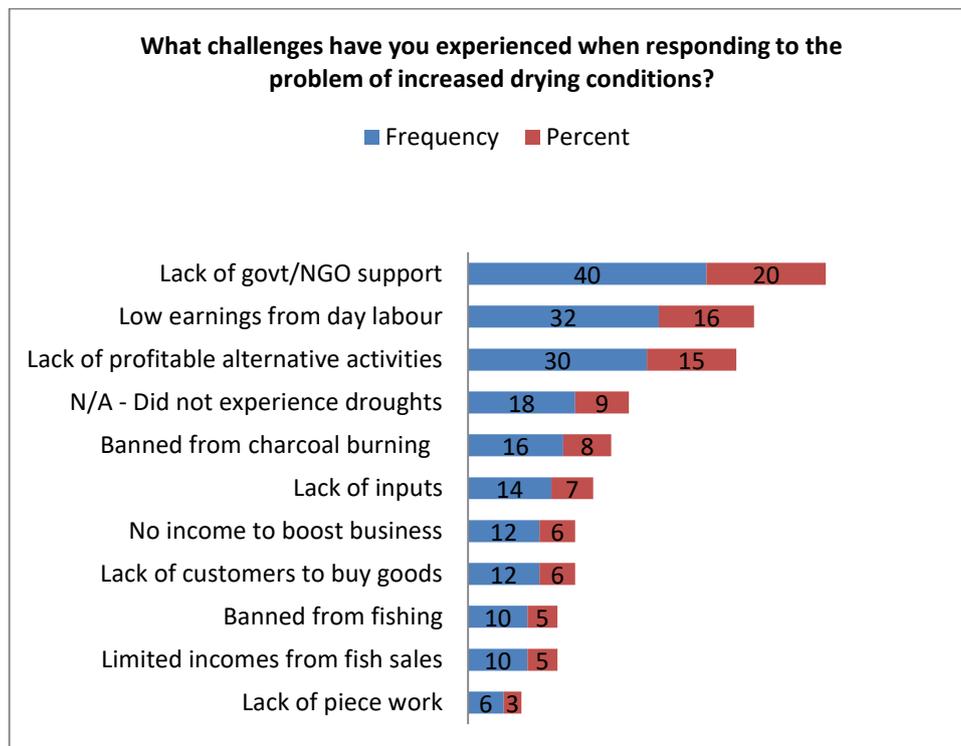
Further, other response strategies were noted during focus group discussions. These included beer brewing and fishing (Interview, 1:1).

“...men engage in fishing activities to sustain their families and women brew beer for sell and sometimes engage in businesses of buying and selling of fish”. – (Focus group discussion, 1:1)

5.2 Challenges Experienced when Responding to Impacts of Droughts

Whilst making substantial efforts to improve general wellbeing and livelihood when impacts of droughts are experienced, coping measures used for survival are not without challenges. Results show that 32 respondents (16 percent) reported that they earned low incomes from day labour whereas 30 respondents (15 percent) indicated that they lacked any profitable alternative activities (Figure 5-5).

Figure 5-5: Challenges experienced in responding to the problem of droughts



Results also show that 16 respondents (8 percent) reported that they were banned from charcoal burning. Lack of income to boost businesses and lack of customers to buy goods, each accounted for 12 responses (6 percent). The least challenge reported to have been experienced when responding to the impacts of droughts was unavailability of day labour jobs or *piece work* opportunities to earn incomes (Figure 5-5).

Other challenges encountered when people tried to improve livelihoods when affected by impacts of droughts were cited during the focused group interviews. The focus group discussion in Mwandi reported that, a lot of lives for the fishermen were lost from crocodile and hippo attacks who risked their lives catching fish to support their families (Interview, 1:1). As a consequence, some fishermen migrated to the Namibian side of the Zambezi River where the attacks from crocodiles and hippos was lesser and fish quantities were seemingly high. However, fishermen further risked their freedoms, because if caught fishing on the Namibian side, they were arrested for catching fish in a foreign country (Interview, 1:1).

5.3 Local Adaptation Measures used in Response to Extreme Floods

Given the potential magnitude of the impacts brought about by extreme floods in some parts of the Simalaha area, greater efforts to adapt to floods have been undertaken at community level. Some households, accounting for 24 respondents (12 percent), opted to make furrows and build ridges to keep away water from reaching their fields and/or homes, whereas others (2 respondents), stay within flooded homes but elevate sleeping beds to avoid getting flooded during night time (Figure 5-6).

With regards to reducing their vulnerability to food insecurities, 26 respondents (13 percent), learning from NGO campaigns on bee keeping as an alternative livelihood activity, also diversified from crop production to keeping bees in order to produce honey for sale, whereas 22 respondents (11 percent) opted to rely on charcoal production. Further, 18 respondents (9 percent responses) reported that they engaged in other business activities to sell food staffs, groceries or selling fish (Figure 5-6).

Figure 5-6: Household survival strategies in response to floods

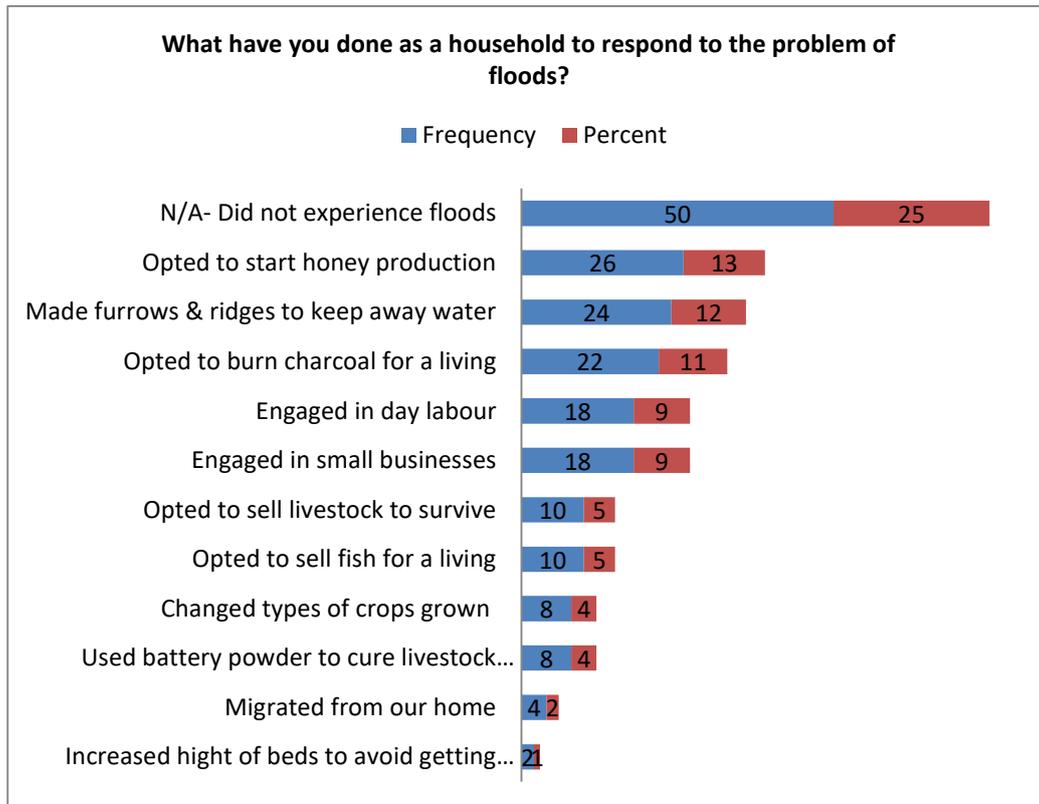


Figure 5-7 shows some of the adaptation activities most prominent in the Simalaha area used to earn incomes in response to floods and/or droughts. It should be pointed out that for some households, such activities are not alternative livelihood activities for adaptation but main sources of income because not everyone is involved in crop production.



Figure 5-7: Examples of business activities used to adapt to floods or droughts in the Simalaha area

Floods or water logging were also said to impact on the livestock (Figure 5-8). As noted by one male respondent during a focus group discussion in Siankande Community,

“...Goats experience a very bad skin diseases when the area is too flooded which sometimes lead to death of the small ones. Floods also cause foot and mouth disease for cattle”. – (Focus group discussion, 1:3)

Figure 5-8: Goat affected by skin diseases due to too much water

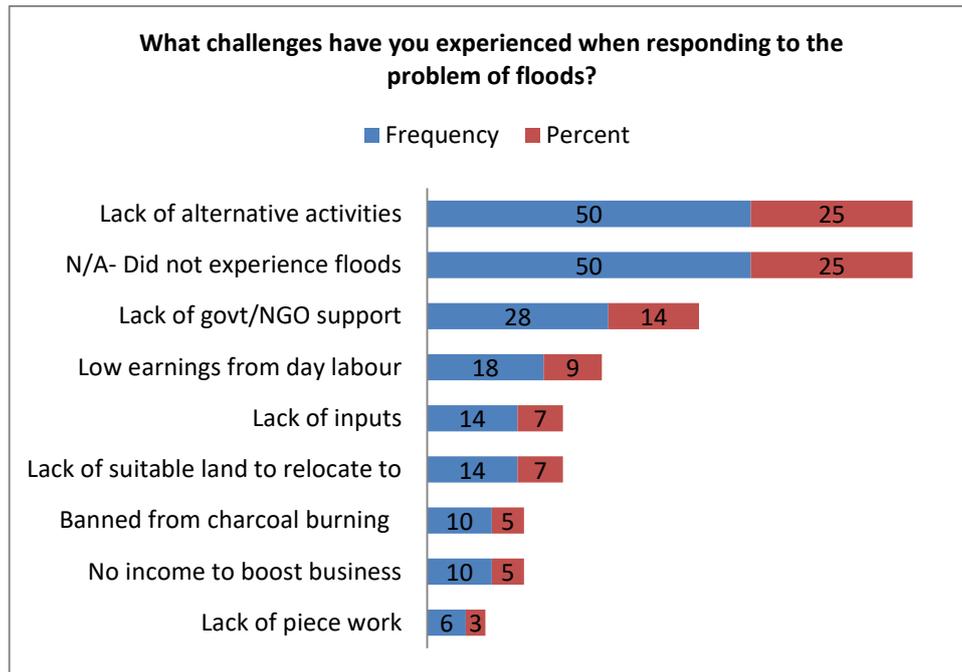


To adapt to animal diseases, farmers have started treating livestock affected by skin diseases with powder from the battery cells. About 8 respondents (4 percent) reported that they started using powder from battery cells because the area lacked veterinary services to treat their livestock or pharmacies to buy required drugs (see Figure 5-6 and Figure 5-8 above).

5.4 Challenges Experienced when Responding Impacts of Floods

Results show that the major reported challenge experienced when responding to the problem of floods was lack of alternative activities when crops failed as a result of floods. Fifty (50) respondents or (25 percent) reported that there were no alternative livelihood activities when crops failed as a result of floods (Figure 5-9).

Figure 5-9: Challenges experienced when responding to the problem of floods



Other major challenges cited included lack of government support (28 respondents) and low earnings from day labour (18 respondents). Lack of government support was cited mostly by households that had no interaction with meso-level institutions when affected by floods or droughts. For instance, while others received support in form of goats, seed inputs or advice on adaptation measures to use, the larger part of the population were not supported mainly because meso-level institutions did not visit their locations, probably due to lack of funds to cover all affected communities. The least cited issue as a challenge to adapt to floods was the scarcity of batteries and cell/battery powder required to treat livestock diseases with 3 percent responses (Figure 5-9).

5.5 Local Adaption Measures used in Response Temperature Increases

At community level, there are not many strategies devised to reduce the burden of high temperature in the study area. A lot of people just bear the brunt of the heat because there are not many solutions available. However a few strategies are devised to reduce the impacts brought about by high temperatures. For instance, to preserve food, during the hot periods and to keep water cool for drinking, people in the Simalaha area use

indigenous pots. Figure 5-10 shows the kind of pots used to cool off water and preserve food in hot weather.

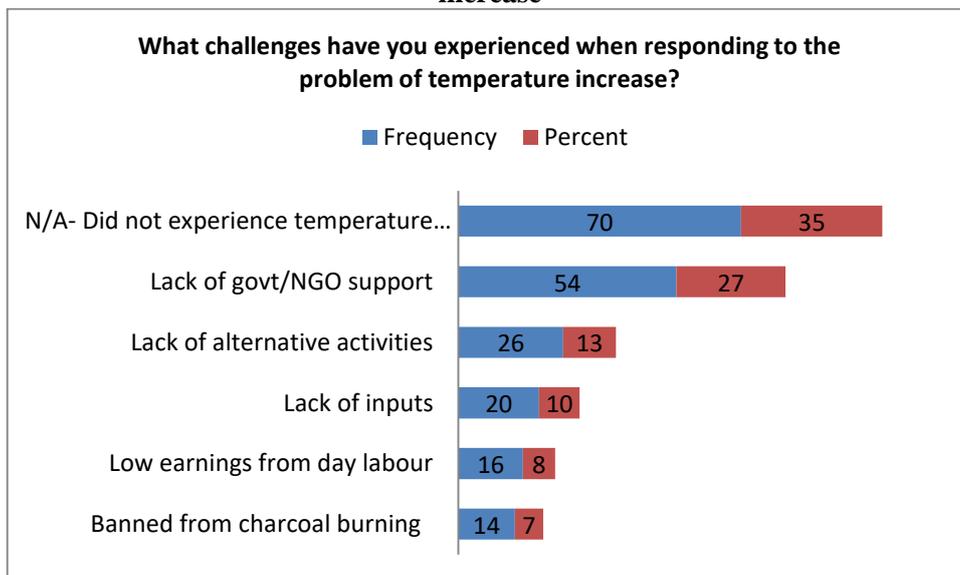
Figure 5-10: Local pots used to preserve food and keep water cool



5.6 Challenges Experienced when Responding to Temperature Increases

Fifty-four (54) respondents (27 percent) reported that most challenges experienced in responding to temperature increase were lack of support from the government or NGOs (Figure 5-11).

Figure 5-11: Challenges experienced when responding to the problem of temperature increase



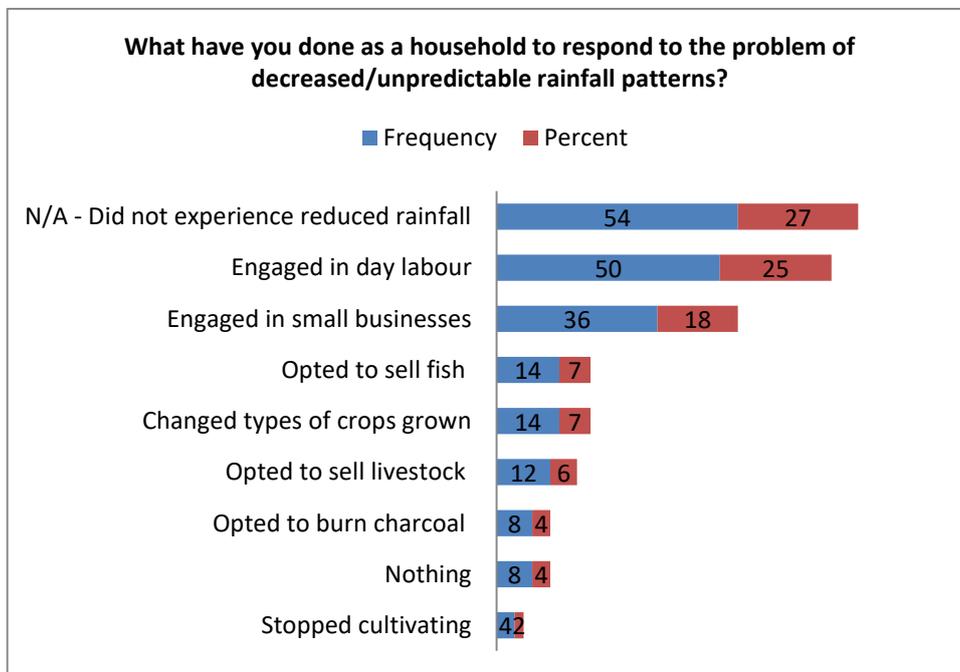
Results also show that lack of alternative livelihood opportunities and lack of inputs were also mentioned as some of the challenges encountered when responding to the problem of temperature increase.

Other respondents (16) or 8 percent cited challenges of low earning from day labour as a problem, whereas others cited being banned from charcoal burning (14 respondents or 7 percent) as a problem (Figure 5-11). Further, increased temperature affected the ability of some varieties of crops to grow and mature properly. As a result, some people changed the types of crops grown to suit the hot climate.

5.7 Local Adaptation Measures used in Response to Rainfall Variation

Assessments showing adaptation measures used by people affected by reduced and unpredictable rainfall patterns show that the majority of households (50 respondents or 25 percent) opted to engage in day labour to raise incomes to support families when crops failed as a result of reduced rainfall (Figure 5-12).

Figure 5-12: Adaptation measures used in response to reduced/unpredictable rainfall



Some of the day labour engaged in included catching fish for wealthier fishermen/women with fishing equipment such as nets and boats and also working in fields and gardens for other local people with big fields. Other forms of day labour engaged in included roofing/thatching houses for small wages as well as working in other people's fields.

Other measures used to adapt to unpredictable rainfall included engaging in small businesses accounting for 18 percent responses. Major small businesses engaged in included brewing/selling of local beer, selling fish, gardening/selling vegetables, selling livestock and engaging in crafts such as carpentry and basket making to raise incomes.

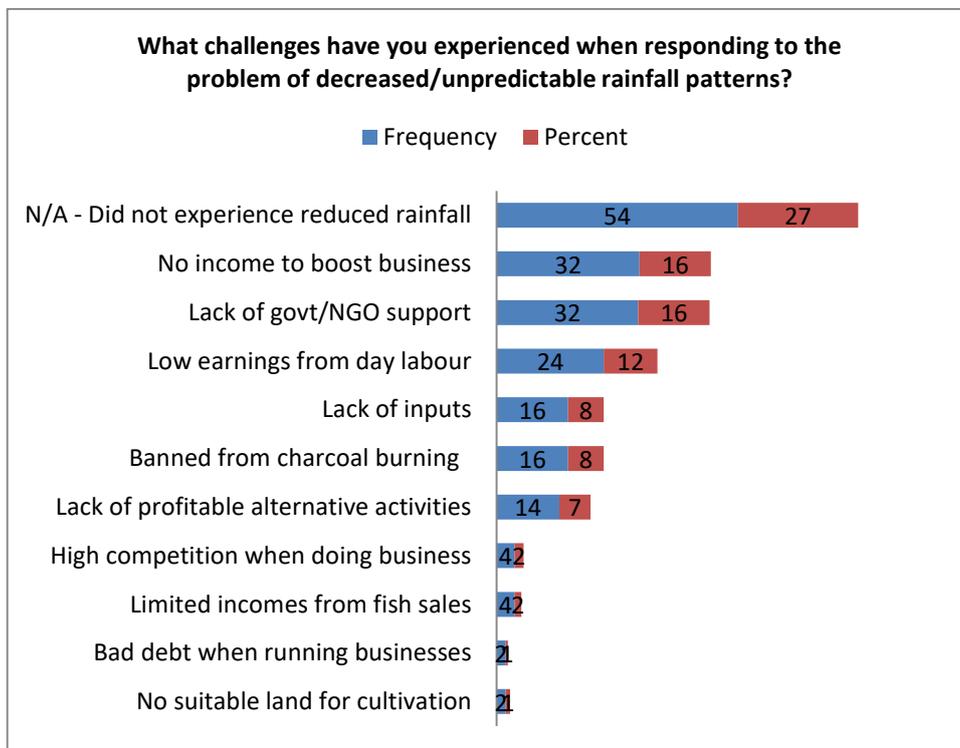
Other coping measures cited by 14 respondents (7 percent responses) included selling fish whereas 8 respondents (4 percent) cited burning charcoal for sale as a coping measure used. Further, some 4 respondents (2 percent) reported that they stopped cultivating their land all together to avoid constantly having failed crops (Figure 5-12).

5.8 Challenges Experienced when Responding Decreased/Unpredictable Rainfall Patterns

In the study area, 32 respondents (16 percent) complained of lack of government or NGO support to adapt to new challenges faced when responding to decreased rainfall patterns (Figure 5-13). Equally lack of income to boost businesses when crops failed as a result of unpredictable or reduced rainfall was cited to be a challenge by 32 respondents (16 percent).

Other challenges cited by 24 respondents (12 percent) included low earnings from day labour whereas lack of inputs required for improving crop output in seasons of reduced rainfall was cited by 16 respondents (8 percent). Further, some challenges cited included limited alternative livelihood opportunities that could easily replace rain fed agriculture, lack of profitable alternative livelihood opportunities and being banned from charcoal burning (Figure 5-13).

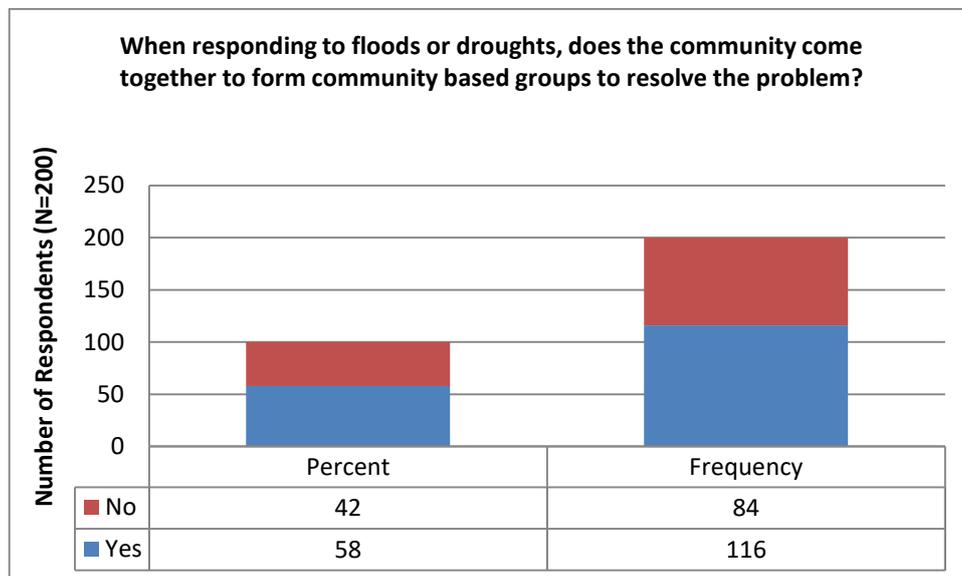
Figure 5-13: Challenges experienced when responding to the problem of reduced/unpredictable rainfall patterns



5.9 Community/Village Collective Adaptation Responses to Floods and Droughts

When asked whether or not people came together to form community based groups to respond to the problem of floods or droughts, 116 respondents (58 percent) said yes whereas 84 respondents (42 percent) said no (Figure 5-14).

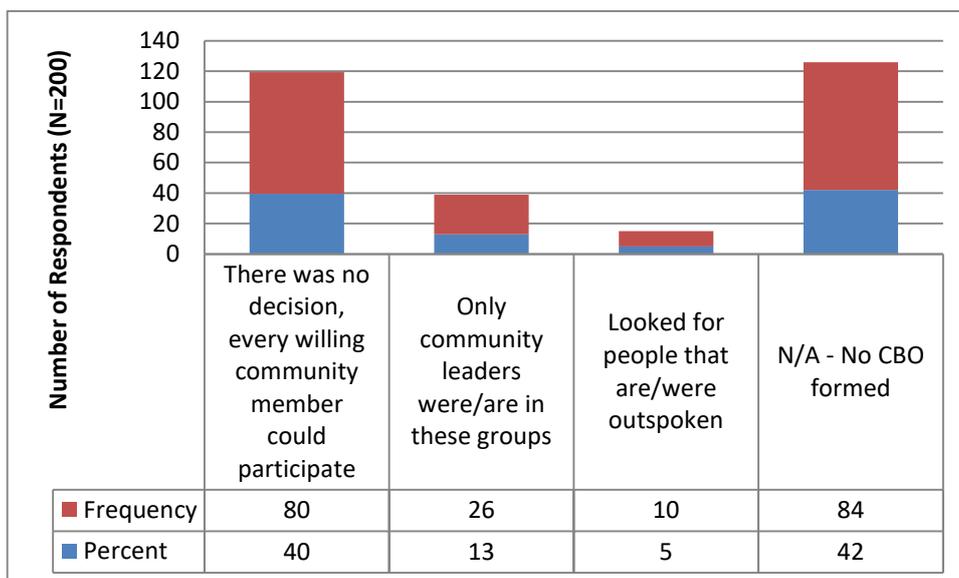
Figure 5-14: Communities forming community based organisations to respond to droughts or floods



When deciding who should be part of the community based groups, results show that every member of the community could join the community based groups. There were generally no spoken rules nor restrictions on who would participate because every willing member of the community was free to become a member of the community based organisations. About 80 respondents (40 percent) reported that every willing member could join the community groups (Figure 5-15).

However, only 26 respondents (13 percent) reported that only community leaders were/are members of the community based groups, whereas 10 respondents (5 percent) indicated that community based groups were dominated by people that were outspoken in the community (Figure 5-15).

Figure 5-15: Decisions on composition of community based organisations



As shown in the above (Figure 5-15), the majority reported that every willing community member could participate in the community based groups responding to droughts or floods. However, although there may not be any formal rules against joining the groups, in literal terms, there may be other constraints against joining or to fully participate in the groups. For example in some groups, membership fee and monthly fees guarantees one’s participation in the group. In Kawana Community, it was reported during the focus group discussion that:

“...Each member of the Lima group is expected to contribute a monthly fee of K10 which is saved in confers to be accessed when faced with droughts or floods... This means that, [when members are affected by environmental challenges, they] members can borrow money from the club funds, and pay back with interest once they have succeeded to come out of the problematic situation ... members also contribute money to buy fabric for sowing table clothes and bed sheets for sell to raise income for the groups.” – (Focus group discussion, 1:2)

Such prerequisites of monetary contributions would already eliminate some poor households with no monthly income to participate in the projects. It is no wonder that some community members felt such groups were dominated by community leaders who generally are the elites of poor communities.

When asked the kind of activities that were undertaken in the community based organisations, 114 respondents (57 percent) reported that they held meetings to discuss various issues affecting communities (Table 5-1). Other notable activities undertaken in the community based organisations include capacity building on improved farming methods and dialogue with meso-level institutions on matters affecting communities. This accounted 34 and 36 respondents, respectively (Table 5-1).

Table 5-1: Activities undertaken in the community based organisations

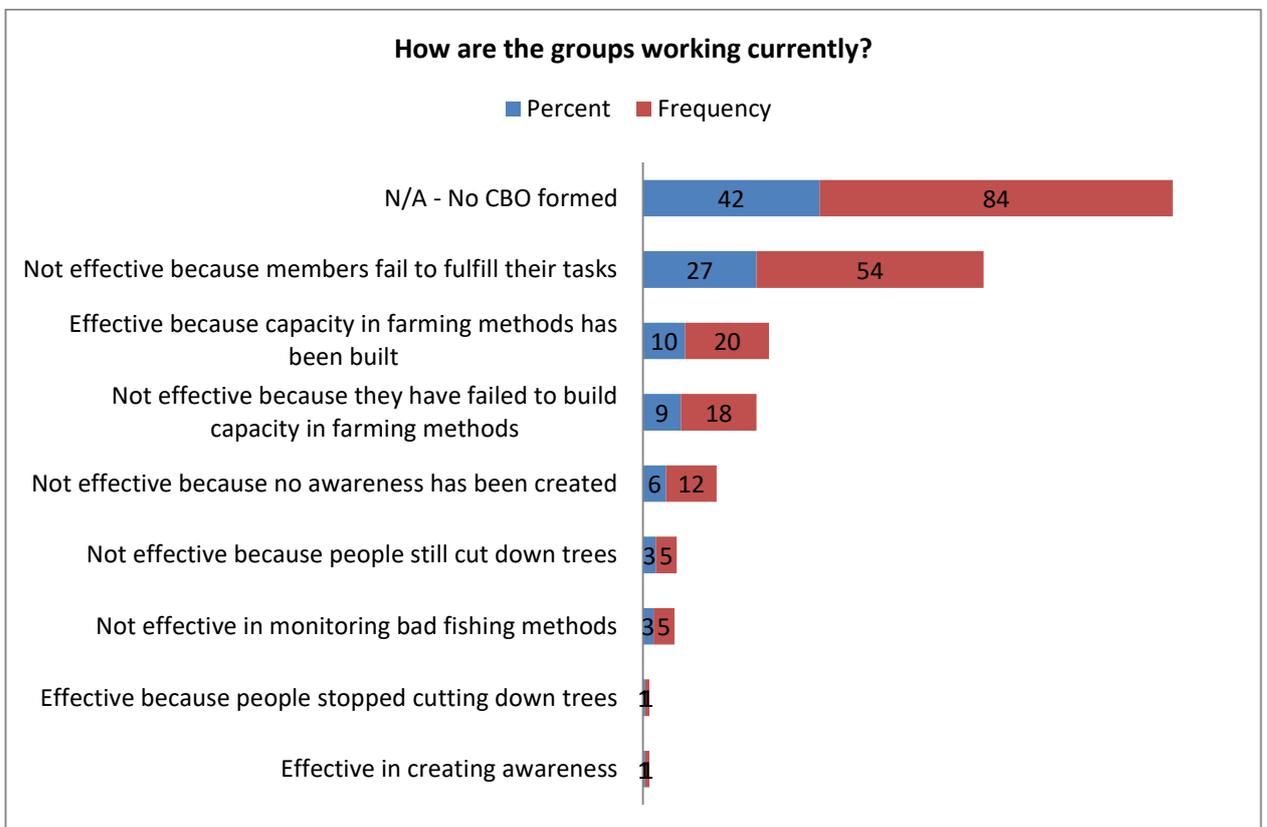
Adaptation support	Response	Frequency	Percent
Community Meetings	Yes	114	57
	No	2	1
	N/A – No CBO formed	84	42
Awareness creation on good fishing methods	Yes	4	2
	No	112	56
	N/A – No CBO formed	84	42
Capacity building on improved farming methods including conservation farming methods	Yes	34	17
	No	82	41
	N/A – No CBO formed	84	42
Awareness creation on the importance of preserving trees and the environment	Yes	14	7
	No	102	51
	N/A – No CBO formed	84	42
Meetings with meso-level institutions to express grievances on matters affecting communities	Yes	36	18
	No	80	40
	N/A – No CBO formed	84	42

Details of other activities undertaken in the community based organisations were highlighted during the focus group discussions. In Mwandu Central, community members responded to prevalent droughts by raising funds for poultry farming (Interview, 1:1) whereas in Kawana community, a group called Lima Club was formed after emulating other nearby communities on how members were being supported when their crops failed as a result of droughts or floods. The Lima groups pooled funds from members to invest in income generating activities such as crafts making (Interview, 1:2). In Namapande and Siankande, respondents reported that they formed farming clubs to grow vegetables and

raise livestock e.g. cattle, goats and chickens, for sell to raise income used to support members affected by droughts (Interviews, 1:3, 1:4).

With regards effectiveness of how the groups were currently working, results show that 54 respondent (27 percent) indicated that the groups were not effective because members failed to fulfil their personal tasks (Figure 5-16). Further, 18 and 12 respondents (which accounts for 9 and 6 percent), reported that the groups have failed to build capacity about improved farming methods and no awareness was created, respectively.

Figure 5-16: Effectiveness of the groups in responding to the problems the communities face



The focused group meetings also recounted reasons for the failure of the community based groups. According to a female respondent in Kawana Community:

“...The Lima group is not working well because some members deliberately refused to repay the funds after they had been helped.

Sometimes, some members deserted the group after borrowing so that they cannot feel obligated to refund the money. This has caused conflicts within groups and discouraged other members to be consistent with making their monthly contribution of the fees or participate in fund raising activities for the club”. – (Focus group discussion, 1:2)

However, there were 20 respondents (10 percent) that reported that groups were working well because capacity in good farming techniques had been built (Figure 5-16). Equally, the focus group discussion in Siankande community heard that there was cooperation among members of the farming club that grew vegetables. Group constraints expressed were only noted on accessibility of crop inputs:

“... The group is working well because people have the willingness to participate in group activities. [However], crop inputs like seedlings are not easily accessible here because the distances that have to be covered to access them are quiet long”. – (Focus group discussion, 1:3)

5.10 Conclusions

Results have shown that there a number of response interventions used by communities when faced with droughts, reduced rainfall, floods or increased temperature. However, interventions such as planting early or planting seed crops late were not mentioned as adaptation strategies used by communities as adaptation practices. Yet, the succeeding Chapter will show that meso-level institutions such as the meteorological department used weather forecasts to develop messages disseminated to people through radio and other media about suitable planting periods either early or late. Similarly, no respondent reported that through autonomous efforts, they replaced cattle rearing with goats – an intervention reported by meso-level institutions (in the succeeding Chapter) that is one of the favourable interventions for livestock restocking. Yet, communities seem to have accepted restocking of goats when they lost cattle or never had any. This shows the unwillingness of cattle owners to replace cattle with goats. Actual selling of cattle to buy goats by pastoral farmers does not seem to be a favoured adaptation strategy among cattle keepers because cattle are held as a traditional symbol of wealth. Therefore, in the

Simalaha areas introducing goats as a livestock restocking measure is something that comes purely from external interventions.

However, Table 5-2 categorizes some of the local interventions used by communities when responding to climatic challenges, into Agrawal’s classifications of local adaptation strategies.

Table 5-2: Types of adaption practices used in response to droughts, floods, changing temperature and rainfall patterns

Problematic Situation	Adaptation practice	Adaptation measure used
Droughts	Mobility	<ul style="list-style-type: none"> Relocating to cattle to main river channels when it gets too dry in the upland
Droughts/Floods/Temperature increases/Poor rainfall	Diversification, Exchange	<ul style="list-style-type: none"> Engage in small business activities to earn incomes when crops failed
Droughts/Floods/Temperature increases/Poor rainfall	Diversification, Exchange	<ul style="list-style-type: none"> Catch and sell fish to earn incomes when crops fail.
Floods	Diversification	<ul style="list-style-type: none"> Use floods to grow flood tolerant crops e.g. rice
Droughts/Floods/Temperature increases/Poor rainfall	Exchange	<ul style="list-style-type: none"> Also cut and sell grass used for thatching houses
Droughts/Floods/Temperature increases/Poor rainfall	Exchange	<ul style="list-style-type: none"> Selling livestock e.g. cattle, goats and chickens to earn income to buy food
Floods	Diversification	<ul style="list-style-type: none"> Devised a cheap method of treating livestock’s foot and mouth disease with battery powder
Droughts/Temperature increases/Poor rainfall	Communal pooling, Storage	<ul style="list-style-type: none"> Making scoop holes to access water
Droughts/Floods/Temperature increases/Poor rainfall	Exchange	<ul style="list-style-type: none"> Engaged in day labour to earn incomes
Droughts/Floods/Temperature increases/Poor rainfall	Diversification, Exchange	<ul style="list-style-type: none"> Opted to burn charcoal for sale to earn a living
Droughts/Temperature increases/Poor rainfall	Diversification	<ul style="list-style-type: none"> Changed the types of crops grown e.g. Cassava, millet and sorghum
Droughts/Floods/Temperature increases/Poor rainfall	Communal pooling, Exchange Storage	<ul style="list-style-type: none"> Forming farming clubs and crafts making

As can be seen from Table 5-2, the most adaptation practices used by communities are diversification and exchange. The two are perceived as the most favourable forms of adaptation because they are perceived as strategies that would bring out favourable outcomes of continuity with general livelihood despite facing adverse situations brought about by floods and/or droughts. For example, when responding to the problems of

reduced crop outcomes as a result of floods, droughts, increased temperature and rainfall variations, community members may engage in day labour to earn incomes that would continue to sustain their food availability other than farming; or they may engage in charcoal burning to earn income or opt to catch fish for sale to earn income. This shows that communities will tend to come up with interventions that are available at their disposal and also suitable within their capability.

In areas prone to floods, some people may tend to relocate to drier areas because staying on puts them at a high risk of experiencing worse losses than they would if they relocated. Mulombwe - Kasaya, for example is located in proximity to tributaries prone to flooding, which means that people are most vulnerable to floods and experiencing complete losses of property if they opted to stay within their homes during flooding (Interview, 1:5). The best adaptation measure used is therefore to relocate to higher grounds because this is what is seen to be an appropriate adaptation measure for that community. Therefore, devised adaptation measures used are dependent on people's analysis of their vulnerabilities, risks and capacities (CARE, 2013).

However, whilst some of the communities affected by floods may choose to relocate from their usual habitations when they experience floods, others may choose to stay on because their perception of the magnitude of floods may not be so severe to warrant displacement or disrupting their social order. However, when floods or droughts persist some people may just stop cultivating certain types of crops such as maize and start growing crops such as rice or cassava suitable for flood or drought prone areas, respectively. Arriving at decisions, on making changes to the types of crops grown is usually influenced by institutional intervention though may sometimes be autonomously driven.

Communal pooling and storage was only used as adaptation interventions for communal water resource access and community based clubs used to support members facing hardships as a result of failed crops. It would be expected that storage could also be used to reserve surplus crop outputs in years of excess, but people sold most of it to the Food

Reserve Agency (FRA) and remained only with sufficient for consumption (Interview, 1:4).

CHAPTER 6

MESO LEVEL INSTITUTIONAL RESPONSE TO CLIMATE CHANGE ADAPTATION

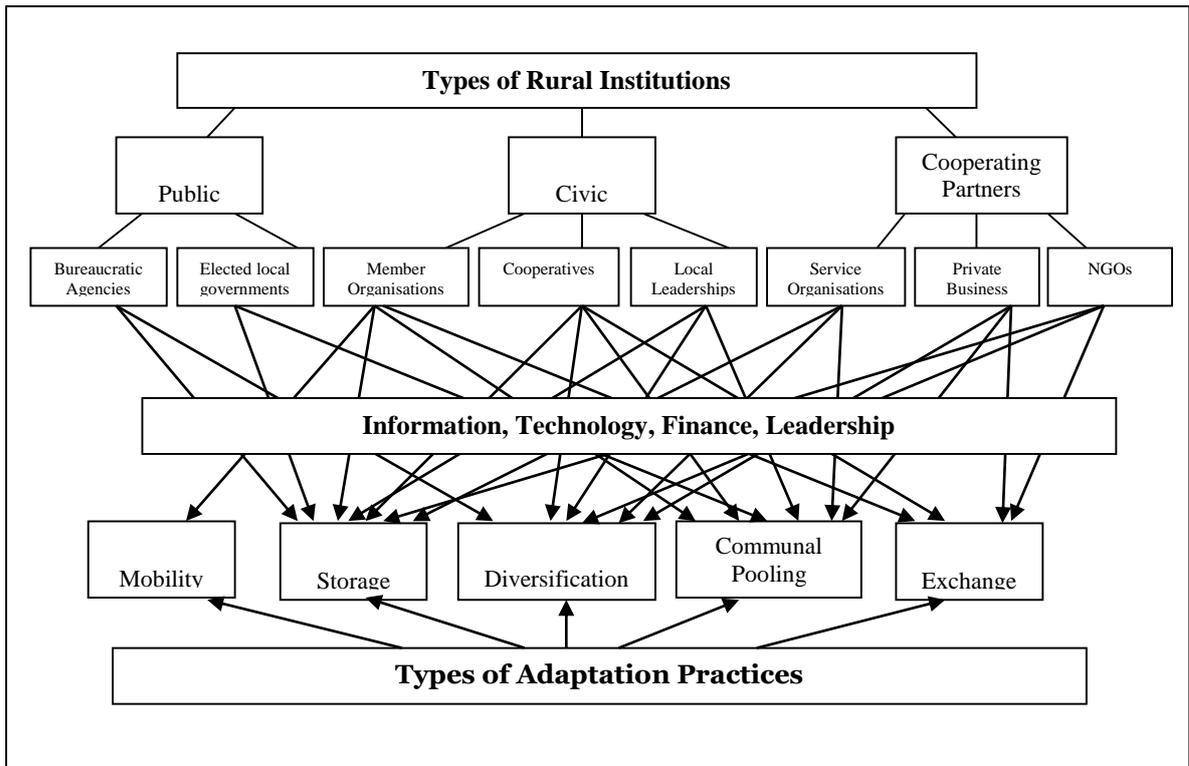
6. Introduction

This Chapter answers the second research question of the study which is, “in what ways and to what extent do meso-level institutions respond to climate change in the study area?” Methodologically, a qualitative approach was used to explain ways and the extent to which meso-level institutions responded to climate change in the Simalaha area. Therefore addressing the needs of this chapter entailed engaging district personal in Kazungula and Sesheke districts in consultative meetings and in-depth interviews to explore their experiences and work on climate change. This Chapter therefore explores how meso-level institutions with interests in supporting adaptation to climate change at community level, are responding to perceived and documented climate change. The chapter also explores the extent to which meso-level institutions minimise the costs of climate change outcomes through adaptation measures suitable for specific situations.

6.1 Types of Meso-level institutions Supporting Adaptation to Climate Change

In the Simalaha area, there are different types of institutions/organisations supporting adaptation to climate change. These include public institutions, civil society institutions and cooperating partners. In Figure 6-1 below, we classify existing meso-level institutions supporting adaptation to climate change in the Simalaha area using Agrawal’s (2008) framework.

Figure 6-1: Meso-level institutions and their interventions to adaptation practices



Source: Agrawal (2008)

6.1.1 Local Public institutions

Public institutions can be defined and classified according to their undertaking and organised structure (Perrow, 1986; Selznick, 1957). Public institutions can be seen in their influence and pure bureaucratic nature (Weber, 1978) and upholding the efficiency level of management or administrative principles such as specialization, centralization, and unity of command (Fayol, 1949). However, within the broad classification of local public institutions, Agrawal (2008) recognises that other distinctions can be used to classify local public institutions as, local governments (organizations accountable to a local constituency through elections or some other mechanisms) and local agencies (agencies or arms of higher levels of government operating at local levels). In the Simalaha area, both local governments (elected local government) and local agencies such as government line ministries and departments, and the district administrative office have been found to have interest in supporting adaptation to climate change (Interviews, 4:1; 4:2). This was shown through responses provided during a card session activity when

workshop participants were asked to write down activities on climate change adaptation that they were involved in as individuals or as organisations (Figure 6-2).

Figure 6-2: Individual and organisation work on climate change adaptation activities written on cards and stuck on the wall during a card session in Sesheke district



However, while public institutions take on responses of climate change adaptation in the study area, such work is not strongly inclined to their daily activities or work schedules compared to disaster response of floods evacuation, for instance (Interviews, 4:1; 4:2). Moreover, there is no public institution at district level that is strictly mandated to work on climate change adaptation issues. The closest institution that works with climate change related aspects is the Disaster Management and Mitigation Unit (DMMU) working as the District Disaster Management and Mitigation Committee (DDMMC) and the agricultural department.

The DDMMC deals more with disaster risk reduction, a concept which encompasses preparedness and early warning in drought and flood prone areas. The agricultural department on the other hand, are traditionally of great importance in promoting adaptation to climate change, though their main concern is on farmers and agriculture. The agricultural extension section consists of members specialised in farming affairs that take on the roles of resource distribution, training, facilitating, coordinating, and farm management consultants. Efforts of the agriculture extension workers are mainly on

improving how people will achieve optimal benefits from agriculture even when there is climate change. Emphasis on training of farmers of better methods to be used in farming is also intended to achieve optimal results from crop production and animal husbandry. In Table 6-1, we show the general mandates of local public meso-level institutions and their interests in climate change adaptation, in the Simalaha area.

Table 6-1: Local public meso-level institutional mandates and responses to climate change

Public meso-level institution	“Daily” Institutional Mandates	Responses to climate change adaptation and interests
District Administrative Office	Politically driven to provide administration regarding district affairs. The office is headed by the district commissioner who supervises administrative affairs of the district.	Headship of the District Disaster Management and Mitigation (DDMU) Unit is held by the District Commissioner. Climate change adaptation issues are planned for during DDMMU meetings.
District Council	Provides services of general development and governance, water and sanitation development, infrastructural development and sensitisation on public health.	Decentralisation planning has mainstreamed climate change adaptation as part of district council planning though it is not been met with relevant funding. Also offer sensitisation and training on climate change adaptation.
DMMU/DDMMC	The DMMU operates as an entity under the Office of Vice-President to protect citizens, their assets and the environments against natural disasters such as floods.	Seeing the frequency with which disasters occurred in the study area, the DDMMU no longer only respond to disasters alone. An inclusion of disaster risk reduction has been done and covers aspects of preparedness and early warning systems.
Department of Agriculture	Supports good agricultural practices to promote high productivity in the agricultural sector. Achieved by providing extension services on the adoption of improved farming technologies to farmers that are seen to be relevant for improving a sound agricultural base.	With recurrent droughts occurring almost every year, they have been supporting the use of early maturing varieties of maize and other crops. They also support technologies like conservation agriculture to reap the ultimate benefits of moisture and nutrients, retention.
Veterinary Department	In charge of supporting livestock development through vaccines of foot and mouth and Contagious Bovine Plural Pneumonia (CBPP). The department also trains pastoral farmers of	Have no direct concerns with regards climate change adaptation. However, the department recognises that with the drying up of ponds and other open sources, livestock diseases increase because livestock come

	different aspects of animal husbandry.	together at available water sources for drinking. The department therefore supports livestock vaccinations to reduce epidemics.
Forestry Department	Legalised by the National Forests Act of 1999 to manage forest resources and enforcing use and harvest of forest resources.	Concerned with protecting the forests from excessive logging for charcoal and timber. Supported some communities in alternative livelihood options such as bee keeping to reduce on excessive deforestation.
Meteorological Department	Has a primary responsibility of providing meteorological services, i.e. weather and climate information to the general public and different sectors in Zambia. This is achieved by observing weather patterns, analysing and predicting it for purposes of protecting human life and property.	Under the division of Forecasting and Research, the department provides real-time climate data on early warning systems and information about the occurrence of different climatic conditions, predictions of floods and droughts to improve on response strategies and adaptation.
Department of Community Development	Mandated to alleviate suffering of the poor and empower the vulnerable in communities. This is achieved under four Major programmes including Food Security Pack; Women Empowerment; Self Help Initiative and Non-Formal Education and Skills Training	In Sesheke, through the Food Security Pack, farmers are supported with seed varieties suitable for soil and rainfall type to improve crop productivity. Winter farming is also supported in wetland areas to achieve food security for drought prone areas.
Zambia Wildlife Authority	Mandated to manage and conserve Zambia's wildlife, and endeavours to integrate the wildlife policy with economic, environmental and social policies to ensure effective contribution to sustainable national development.	Support of conservation agriculture in Game Management areas and wildlife corridors.

Source: (Interviews, 2:2; 2:5; 2:6; 3:4; 3:11; 3:22; 4:1; 4:2; 5:1; 5:2; 5:3)

As can be seen from Table 6-1, the local government or district councils are deemed as or act as institutional anchoring points for development projects. Whether acting in their own capacity or representing a donor/funding agency, district officers from the councils offer technical expertise to implement projects in communities. The projects could cover a wide range of rural needs such as housing, roads, bridges and water supply some of which include aspects of adaptation to climate change (Interviews, 2:5; 2:14). However, despite having the technical expertise required to support communities and potentially

having greater influence over the design of how climate change adaptation support should be implemented, district councils tend to follow rather set policies and recommendations proposed by central level government. In many instances, they also lack adequate funding required to execute projects (Interview, 2:5; 2:14). More often than not, they rely on the central government to fund proposed activities to implement projects. Obviously, access to such funding might not be easily attainable, but through development and submission of project proposals to government line ministries for assessment, such funding may be availed if the evaluation is deemed feasible (Interview, 2:5). Therefore, there has not been de facto devolution of powers, to local governments with broad-based resources to improve implementation of activities and projects for rural development. Nonetheless, projects involving support of overseas donors have trickled down to the district level to execute development projects, including climate change adaptation projects; because councils are seen as the custodians of local level governance in rural areas.

6.1.2 Civil Society Institutions

Civil society institutions include community groups, cooperatives, cultural groups, trade unions, churches etc. According to Agrawal (2008), the definition of civic institutions can further be categorised into two types of institutions. The first type is structured as a membership organisation that functions in a similar manner to company organisations. Their functionality is motivated by the need to advance common interests for its members. The second type functions as cooperatives which work more like a partnership and help members pool resources for improved economic outcomes (Agrawal, 2008).

While civil society institutions are principally not expected to engage in governance issues, they have some level of involvement in governance. They provide inputs for policy choices that are sometimes implemented. This is particularly evident with the Chiefs who have formal statutory mandates. They are not the state yet often actively oppose its choices and governance, and they are affiliated with the authority of the state in some respects.

Like public institutions, civil society institutions have aligned climate change adaptation in response to support communities affected by recurrent droughts and floods in the study area. However, they too have own institutional mandates which they carry out on a daily basis which are not entirely centred on adaptation to climate change. In Table 6-2, we show some general roles of civil society institutions at local level and their institutional mandate. Table 6-2 also shows how civil society institutions take on climate change adaptation responses in the study area.

Table 6-2: Civic meso-level institutional mandates and responses to climate change

Civil Society meso-level institution	“Daily” Institutional Mandates	Responses to climate change adaptation and interests
Civic leaders (Chiefs and headmen)	Responsible for governing selected communities or villages within a given locality. They also act as a link between government and communities in pushing the development agenda for their communities.	They are influential in pushing the agenda on which climate change projects to be executed within their communities.
Zambia National Farmers Union	A member driven organisation that safeguards and promote farmers’ interests. The organisation also acts as a mouth piece for farmers in lobbying for government support and response to farmers’ agricultural needs.	The organisation offers its services to small scale farmers in form of securing bank loans on farmers’ behalf; train small scale farmers on how to adapt their farming methods to changing weather patterns; and link farmers to markets and market opportunities.
Satellite Disaster Management and Mitigation Committee	Community based committee that acts as a link between the DDMMC and the community to create climate change awareness	Train farmers on disaster preparedness, early warning and response; to identify means of mitigating climatic hazards

Source: (Interviews, 2:2; 2:5; 3:17)

The governance structures of villages in the Simalaha area are very important for development and structuring climate change adaptation benefits to the vulnerable within their societies. While they may not support communities with required “hard” or “soft” adaptation technologies, they act as an intermediary between communities and the government to voice out the kinds of developmental challenges experienced (Interview, 2:5). With recurrent floods and droughts, headmen and chiefs have used their influence to solicit for support of the district administrative office; support which directly targets improving adaptation of the most vulnerable in societies.

On the other hand, if chiefs or headmen do not favour projects being supported, they are in a position to undermine, divert or explicitly oppose meso-level institutional interventions. If not handled with caution, local leaders have the power to ‘suspend’ any form of development taking place on traditional land which is within their jurisdiction (Interview, 2:5). This is because traditional leaders have traditional rights to land within their family lineage and act as custodians of such land (Adams, 2003). Therefore, governments, NGOs and international organisations wishing to implement any form of development, regardless of size have to consult and be in agreement with the chiefs and headmen/women of the land for projects to be successful.

On the other hand, other Civic organisations, such as the Zambia National Farmers Union (ZNFU) act as a mouth piece that lobbies on behalf of farmers to access meso-level institutional support for agriculture (Interview, 3:17). They may sometimes give direct support in form of farm inputs and come up with soft adaptation projects to improve farmers’ produce. Their role does not have rights to traditional land but may operate within lands under traditional jurisdictions with authority from the local leadership (Interview, 3:17).

6.1.3 Non-governmental Organisations/Cooperating Partners

Non-governmental organisations (NGO) are defined based on their types of activities – the delivery of services to people in need, and the organization of policy advocacy, and public campaigns in pursuit of social transformation (Lewis and Kanji, 2009). NGOs also actively participate in an array of other specialised roles such as democracy building, conflict resolution, human rights work, cultural preservation, environmental activism, policy analysis, research, and information provision (Lewis and Kanji, 2009; Lamboll et al., 2011).

In as much as NGOs are supposed to be non-profit making organisations, there are some Community Based Organisations (CBOs) that function similarly to NGOs. In reality, there are often unclear distinctions between NGOs and CBOs, but the latter are sometimes out to make money for its members and working arrangements are not voluntary.

Like Civil Society Organisations, NGOs tend to have particular policy concerns organised around specific issues, such as environment, health, water resource development and climate change adaptation and mitigation. With regards climate change adaptation, they provide analysis and expertise in practical and modern adaptation strategies and serve as early warning mechanisms in adapting to climate change (Interviews, 2:2; 2:8; 3:7; 5:4; 5:5; 5:6). Using their divergent sources of funding, they also help monitor and implement projects in collaboration with civic and public institutions relevant for community adaptation at local level (Interview, 2:2; 2:5; 5:4; 5:6). Table 6-3 shows some mandates of the NGOs working in the Simalaha area. Further, Table 6-3 also shows climate change interests of NGOs in climate change adaptation.

Table 6-3: Non-governmental/Cooperating partners meso-level institutional mandates and responses to climate change

Non-governmental/Cooperating partners meso-level institution	“Daily” Institutional Mandates	Responses to climate change adaptation and interests
Zambia Red Cross Society	Support communities in addressing suffering and crises. Also concerned with empowering communities in livelihood activities; and supports effective governance, management, partnerships and voluntary action.	Respond to both extreme and gradual climate changes affecting the study area. Through Disaster Risk Emergence Fund (DREF), they supported victims of the 2006 floods with temporary shelter, food, clean water and adequate sanitation. They also have a Zambezi River Basin Initiative (ZRBI) project that supports communities in agriculture activities to improve food security in the drought areas
Land O’Lakes International Development	Committed to improving food security and achieve sustainable agricultural development by use of modern corporate technical expertise acquired over time.	With support from USAID, they implemented a two year fodder project to assist communities grow fodder for optimal nutrition for livestock in areas that had less grazing pasture due to droughts. They also support communities with small livestock that are drought tolerant

Caritas Zambia	A Christian organisation grounded on teachings of the gospel and the catholic society. They have dedicated their time to promoting integral human development through witnessing and institutional strengthening.	Has a Community Managed Disaster Risk Reduction (CMDRR) programme of building resilience to climate change for local people in the study area. Also provides communities with livelihood opportunities such as goat production to sustain them in times of crop failure.
Community Based Natural Resources Management (CBNRM)	Focused on land rights and water resources management.	Sensitizing communities on climate change topics and how to manage resources especially water.
Climate Resilience Adaptation Facilitator (CRAF)	Sub-contracted by government to implement climate change projects	Supporting communities in adapting to climate change adaptation through introducing technology that is climate smart. Rehabilitated dams in Simandwa community and put up two mechanised solar powered boreholes in Mbole and Ndemena communities
World Wide Fund for Nature (WWF)	Working with ZAWA in Sesheke to support conservation agriculture in KAZA transboundary frontier protected area	Support of conservation agriculture in Game Management areas and wildlife corridors.

Source: (Interviews, 2:2; 5:4; 5:5; 5:6)

6.2 The Role of Meso-level Institutional Support in Enhancing Adaptation to Climate Change

As shown in the preceding section, meso-level institutions i.e. public institutions, civil society institutions and NGOs have different activities going on supporting adaptation to climate change. However, in this section Agrawal's (2008) theory explains the role of meso-level institutions (i.e. public institutions, civil society institutions and NGOs) and how they support adaptation to climate change at local level in an intricate manner. Using the illustration provided in Figure 6-1 above, the theory suggests that the intervention of meso-level institutions e.g. through climate change projects, potentially influences adaptation outcomes of individuals or communities they support (Agrawal, 2008). Agrawal (2008) discuss four different kinds of support used by institutions to explain processes by which costs of climate change outcomes are reduced. These are information and training; technological innovation, finance investment, and leadership.

For example, information and training is an intervention that agricultural extension institutions will use to provide knowledge about climate variability and influence the need for diversification in crops and agricultural practices. Financial investments on the other hand, supports the implementation of new technologies suitable for local contexts, and leadership is an intervention that guides how communal actions will unfold or develop (Agrawal and Perrin, 2008).

According to Agrawal (2008), the interventions are essential resources necessary to enhance adaptive capacity of communities intended. However how local communities will be affected by climate risks will depend on the manner in which institutional support is rendered, the people that gain access to the support, and institutional means of providing the support.

Agrawal's work recognises the relevance of information support, technological and finance investments and provides an analytical explanation for understanding how meso-level institutional intervention used to enhance adaptation to climate change ought to work. However, it does not take into account more overall governance aspects such as plans and management that are important in supporting local adaptation interventions in the study area. For instance floods or droughts contingency plans developed in Kazungula and Sesheke districts in response to climate change currently cannot be integrated into Agrawal's (2008) framework. For purposes of this study, the meaning of technologies for adaptation in the framework has been adjusted to include "*planning and management*". Further, while technological advancement broadly entails infrastructure alternatives for reducing vulnerabilities and enhancing adaptive capacity, planning and resource governance has been incorporated to technologies for adaptation, because technological advancement rely on climate change plans and policies that have been worked out to show their potential in reducing climate risks. The adoption of conservation agriculture as a technology, for instance, is guided by understanding and planning processes of local environmental conditions that local institutions will identify to be suitable for reduced risks in crop production. Moreover, more comprehensive planning is required to understand management of soil types for sustainability of productivity based on local contexts.

6.3 Types of Support rendered by Meso-level Institutions

Although the systematic distinctions among different types of institutions i.e. public, civic and NGOs are important to bear in mind, the functionality of these organisations often enters into partner relationships with each other (Interviews, 3:7; 5:2; 5:3; 5:5). Such partnerships may sometimes promote cross-cutting collaborations that achieve similar intended adaptation outcomes at local level. In some cases they adopt types of support that are similar based on experienced or identified needs at community level. In the Simalaha area, their efforts towards improving rural adaptation to climate change, has seen an integration of key processes of intervention including information and training, technological advancement, finance investments and leadership (Interviews, 3:7; 5:2; 5:3; 5:5), which are cardinal for local level development (Agrawal, 2008) and sometimes provide short-term protection against shocks (Dercon and Krishnan, 2004; Yamano et al., 2005; de Janvry et al., 2006; Skoufias, 2007; Macours et al., 2012). In the succeeding sections, we show the different types of support used by different types of meso-level institutions to advance adaptation to climate change in the study area.

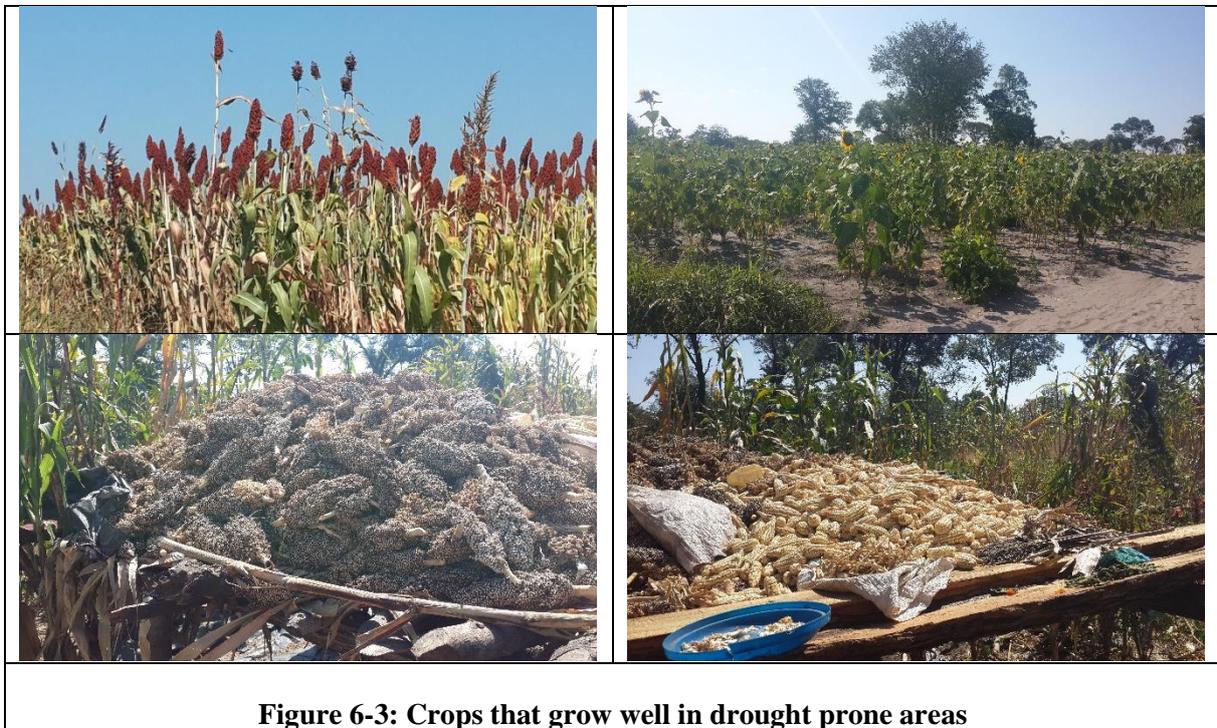
6.3.1 Information and Training

Access to information and training on climate change is critical to the process of adaptation because it structures people's ability to respond appropriately by enabling actors to anticipate long-term risks and make appropriate adjustments to increase their adaptation (Bryan and Behrman, 2013). Incorporation of suitable climate change adaptation information about long term adaptation strategies is used in the Simalaha area by meso-level institutions to support communities build adaptive capacities through information and training on climate change which is a new phenomenon in the area.

- a) Agricultural Department – a district line government agency:* In the Simalaha area, agricultural extension work makes effort to give out messages to communities of diversifying from growing maize as a tradition to growing other drought tolerant crops such as cassava to avoid complete crop losses in times of droughts.

“...The agricultural camp officer has been advising us to reduce on growing maize each year and try other crops that can withstand dry spells such as cassava”. – (Focus group discussion, 1:2)

Key messages focus on growing drought tolerant crops which can be supported with less rainfall. Other crops encouraged that require less rainfall include early maturing varieties of maize, sorghum, millet and cowpeas. In Figure 6-3, we show some of crops encouraged that grow well in drought conditions.



Other key messages of improving advocacy for crop productivity in drought prone areas have been the use of conservation agriculture – potholing and crop rotation to reap the ultimate benefits of moisture and nutrients, respectively.

“... We have gained knowledge from our agricultural camp officer on how to grow crops using conservation farming ... we use it because we see that it gives good yields”. – (Focus group discussion, 1:2)

In addition, climate change alerts in Kazungula district of Southern Zambia, have also prompted the department of Agriculture through the headquarters in the Livingstone Office to develop a system of monitoring weather patterns before the onset of the rains (Interview, 5:7). Such information is disseminated to farmers to equip them with types of maize crop seed varieties to use during the farming season. Sesheke district, on the other hand, is supporting selected local communities with small-scale adaptation of vegetable production through small scale pump irrigation (Interview, 3:1). This is part of the stipulated mandates for the department which focuses on providing technical services in irrigation, mechanisation, technical extension services in crop production, horticultural production and, nutrition.

b) Zambia Red Cross Society – Operating as an NGO: Since the launch of the Zambezi River Basin Initiative (ZRBI)²⁶, the Zambia Red Cross Society with support from Food and Agriculture Organisation (FAO) has taken on a new approach of supporting different communities in Kazungula and Sesheke districts in agriculture activities that promise to improve food security in the drought prone areas (International Federation of Red Cross and Red Crescent Societies, 2012). Through this initiative, 50 households were trained in August 2011 on aspects of conservation farming. Additional trainings were envisaged in the subsequent year of 2012 targeting a total of 500 beneficiaries (International Federation of Red Cross and Red Crescent Societies, 2012).

Currently, the Zambia Red Cross Society, using hydrological models, has progressively continued to monitor water levels along the Zambezi River to provide communities vulnerable to floods with early warnings forecasts of times when water levels are expected to rise (Koelle et al., 2015). This is especially important for purposes of preparedness in safeguarding property and general sources of livelihoods in the event that floods occurred in an area.

²⁶ Zambezi River Basin Initiative is a shared vision among Southern African National Societies to maximize the impact of Red Cross interventions in an integrated and holistic way (International Federation of Red Cross and Red Crescent Societies, 2012).

- c) ***Land O' Lakes²⁷ - Operates as an NGO:*** As with capacity building, Land O'Lakes trained over 76 communities and livestock workers in drought prone areas of Kazungula and Sesheke districts, the Simalaha area inclusive. The training was on animal husbandry and sustainable rangeland management to promote improved livestock management and reinforce environmentally responsible practices (Land O' Lakes, 2014) particularly for dryer areas.
- d) ***Caritas Zambia – A Church Organisation operating as an NGO:*** While it operates in Zambia's tourist capital Livingstone, Caritas has a Community Managed Disaster Risk Reduction (CMDRR) programme of building resilience against disasters in Kazungula and Sesheke districts (Interview, 5:5). The CMDRR programme builds capacity through education and training on community resilience to climate change for local people, targeting 750 households in Sikaunzwe of Kazungula and 550 in Mwandu area of Sesheke (Interview, 5:5). Other areas targeted are areas South of Livingstone in Chief Mukuni's areas.
- e) ***The Meteorological Department – a district line government agency:*** The Meteorological department's participation on information and training for adaptation is on providing farmers and people in general with early warning information about the occurrence of climatic conditions including floods and droughts.

“...As an Act of Parliament, we as the Meteorological department are mandated to provide information about flood, for instance, if we predict lots of rain that can cause flooding in the rainy season ... We also use early warning systems to warn farmers about dry spells if we forecast dry spells”. – (In-depth interview, 5:1)

²⁷ Land O'Lakes, Inc. is a member-owned agricultural cooperative based in the Minneapolis-St. Paul suburb of Arden Hills, Minnesota, focusing on the dairy industry

Early warning systems assist farmers in planning for crop cultivation i.e. when to plant, because knowledge of the kind of rainfall to expect is made available and also the magnitude or extent of the rain. Early warning also assists in predicting whether particular areas would experience droughts or floods. At community level, there are Satellite Disaster Management Committees (SDMC) that support farmers with appropriate disaster management messages.

f) Forestry Department – a district line government agency: With regards to work on climate change adaptation, the Forestry Department has no mandates in that area. The Ministry under which the Forestry department falls, has however work that is related to climate change mitigation. This is done through the implementation of the reduction of emissions from deforestation and forest degradation (REDD+)²⁸ activities in Zambia, at the national and sub-national levels. REDD+ activities and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks are important elements of the climate change regime, seen to potentially reduce global greenhouse gas emissions.

In Kazungula and Sesheke districts, there are currently no direct REDD+ mitigation activities supported from the national REDD+ programme. The major concern for officials working in the two districts is on protecting the forests from the on-going logging of the forests by inhabitants and international millers.

“...We monitor the exploitation of the forest because we want to conserve the environment”. – (In-depth interview, 5:2)

Other concerns for the Forestry department are to enlighten local communities with the dangers posed to the environment and the ecosystem at large of their massive logging.

²⁸ Based on the policy notes from the website of the International Institute for Sustainable Development

“...We also take time to explain what is contained in the Forestry Act to local communities and show them the dangers of cutting down trees so that they don't just cut down trees anyhow”. – (In-depth interview, 5:2)

In Kazungula districts, a selected few households have been supported with initial bee keeping activities as an alternative form of livelihood to reduce their dependence on the forest for general livelihood (Interview, 5:2; 5:3). Sesheke Forestry department, on the other hand, has put in place stringent measures to monitor and regulate tree logging and harvesting of the devils' claw, which is seemingly to be on high demand among locals and is used as one of the primary sources of income for its traders (Interview, 3:13).

g) *Disaster Management and Mitigation Unit – a district line government agency:*

Seeing the frequency with which disasters occurred in Kazungula and Sesheke districts, the DMMU no longer only responds to disasters, but have included in their mandates the aspect of disaster risk reduction (Interviews, 2:2; 4:1). Disaster risk reduction is a principle that identifies, assesses and reduces the risks of disaster. It aims to reduce socio-economic vulnerabilities to disaster as well as dealing with the environment and other hazards that trigger them (UNISDR, 2009). Through this initiative, courses supported by the United Nations were conducted in both districts (i.e. Kazungula and Sesheke) to enlighten the DDMC, of aspects that were required to be passed on to communities during community level trainings (Interview, 2:2). DDMC trainings covered aspects of disaster preparedness, early warning systems and response strategies. Other aspects covered in the course were identification of mitigating measures to climate change hazards and developing flood/drought assessment tools and methods of implementing them (Interview, 2:2).

6.3.2 Technological Innovation

In the realm of climate change, technological advancement is one of the options used today to enhance adaptation for improved livelihood. In the Simalaha area, meso-level institutions support communities with different forms of new technologies in agriculture

and general livelihood to improve adaptive capacities of inhabitants. Table 6-4, shows some of the adaptation technologies introduced in the Simalaha area to reduce impacts of climate change.

Table 6-4: Technologies for adaptation in the Simalaha area

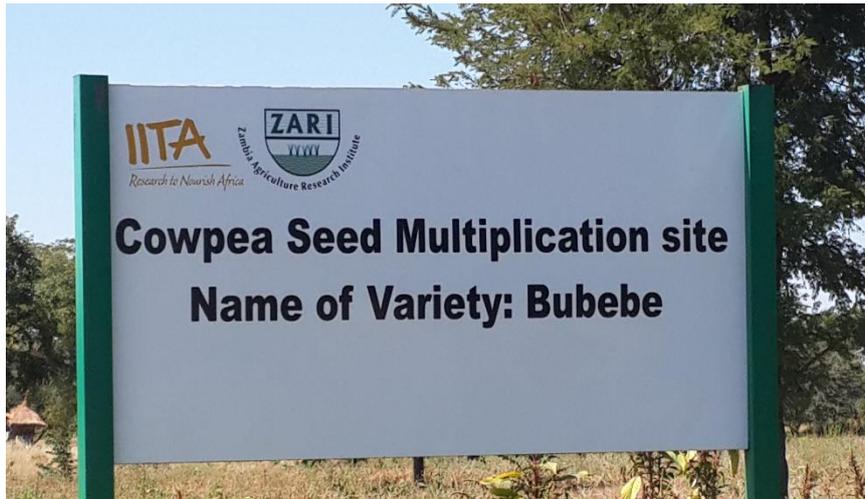
Capacity Building	Withdrawal	Diversifying
<ul style="list-style-type: none"> • Information on best adaptation practices • Development of plans e.g. flood contingency plans 	<ul style="list-style-type: none"> • Relocating flood prone area • Phasing out development in flood prone areas • Creating new technologies such as dams in areas that potentially harvest sufficient water runoffs 	<ul style="list-style-type: none"> • New agricultural practices such as conservation agriculture and rice growing • Developing new seed options appropriate for drought prone and flood prone areas • Promoting growth of drought resistant livestock

Source: (Interviews, 2:1; 2:5; 2:9; 2:14; 3:1; 5:6; 5:7)

a) District Councils – Democratically elected bodies: One of the cardinal technologies developed in both Kazungula and Sesheke districts under the supervision of the District Administration, are flood contingency plans (Interview, 2:1). The plans identify areas prone to floods and likely associated impacts of the floods to livelihood, livestock, infrastructure and social services in order to identify actions that could be undertaken to mitigate such impacts (Interview, 2:1).

b) Zambia Agriculture Research Institute: In the arid Simalaha area, a new hybrid of crops has been introduced that require less rainfall to make better use of scarce water resources (see Figure 6-3 above). The Zambia Agriculture Research Institute is also innovating in new seed varieties and for the multiplication of cowpeas. Currently, ZARI is using Namapande Community in the Simalaha area as one of the multiplication site (Figure 6-4) for cowpeas.

Figure 6-4: Innovation of new crop varieties in the Simalaha area



- c) *Department of Community Development – Government line agency:* Absent in Kazungula district, the Department of Community Development in Sesheke district supports vulnerable farmers with improved maize seed varieties and fertilizer to improve crop productivity for rain fed agriculture.

“... We support farmers in early maturing varieties of maize and fertilizers to assist them improve their crop produce ... Each farmer is supported for two years to build their capacity in crop production and improve their self-reliance ... thereafter; we wean them off and recruit a new set of farmers for similar support”. – (In-depth Interviews, 3:22)

Additionally, winter cropping in wetland areas is supported with different maize varieties and vegetable seedlings to ensure that there is continuity with farming for people throughout the year (Interview, 3:22). The idea behind the support is that once people have harvested, a small portion of the produce is paid back to the supporting institution so that other vulnerable farmers could be supported when the lot on the group has gained self-reliance. However, in 2012/2013, farmers on the programme lost their crops due to droughts and had nothing to give back to the programme (Interview, 3:22). This meant that their stay on the programme was longer than 2 years implying that no new people could be supported that had been waiting to be put on the support programme that year.

d) Climate Resilience Adaptation Facilitator – NGO: Other technologies involve water infrastructural projects, involving dam construction and putting up of boreholes to improve water access both for productive and domestic uses. With support from the World Bank through the Pilot Programme for Climate Resilience (PPCR) project, the Climate Resilience Adaptation Facilitator (CRAF) is rehabilitating a dam in Simandwa community and put up two mechanised solar powered boreholes in Mobole and Ndemena communities (Figure 6-5) (Interviews, 2:5; 2:14; 5:6). The water infrastructure constructed is meant to improve access for stock watering, vegetable gardening and domestic uses as a way of improving water access and a means of adaptation to droughts.



Figure 6-5: Water infrastructural projects in Kazungula District

e) Land O’ Lakes International Development – NGO: As an NGO committed to improving food security and achieves sustainable agricultural development, by use of modern corporate technical expertise; Land O’Lakes came up with the fodder project (Interview, 2:4; 2:9; 2:11). With support from United States Agency for International Development’s (USAID) Office of Foreign Disaster Assistance (OFDA), Land O’ Lakes implemented a two year fodder project designed to assist communities grow fodder for optimal nutrition for livestock (Land O’ Lakes, 2014). This came as a response to lessen the rate at which farmers in the area sold their livestock because their land could no longer sustain the feeding of livestock (Land O’ Lakes, 2014). Moreover, rangelands to support livestock keeping in Kazungula and Sesheke districts was getting more scarce, and the fodder project was seen as a means of sustaining livestock in the two districts.

f) Climate Justice Initiative/ Community Based Natural Resources Management – NGO: As part of the Climate Justice Initiative (CJI) project, the Community Based Natural Resources Management (CBNRM) Forum in Kazungula supported selected communities with 30 treadle pumps, a new technology that improves irrigation and creates opportunities for alternative sources of water from rain-fed, for productive purposes (Interview, 5:6). In Sesheke, similar initiatives of water technologies are supported to improve people’s access to water for vegetable gardening and stock watering (Interview, 3:23).

Nonetheless, while efforts are made to improve access to technologies to reduce impacts of climate change, not all technologies are favourable for people in the study area. The treadle pump for instance is perceived to be unsuitable in areas where deep wells have to be used for irrigation due to its low suction rate and on average a treadle pump can only lift water from about 6 to 7 meters underground (Adeoti et al., 2007; ICIMOD, 201). The technology also requires a lot of effort to pump water. This implies that such a technology would only effectively support small sized areas of less than 0.1 to 0.4 hectares (ICIMOD, 2013). Efficiency in the use of treadle pump is mainly noted when it is developed adjacent to water sources such as small dams and rivers (Interviews, 2:14). With population increases, opportunities of access to land situated in proximity to water sources are limited to accommodate many farmers, and constant utilisation of water sources puts a strain on the already finite water resources.

6.3.3 Finance Investments

a) Zambia Red Cross Society – NGO: In Kazungula District, the Zambia Red Cross Society (ZRCS) has actively participated in responding to both extreme and gradual climate changes affecting the area. For instance, through their Disaster Risk Emergence Fund (DREF), the extreme events of 2006 were responded to by offering support of temporary shelter, food, clean water and adequate sanitation to the 1,500 affected communities in the relocation camps at Kazungula district compound and Kasaya village (International Federation of Red Cross and Red Crescent Societies, 2008).

With support from the European Union and Food and Agriculture Organisation, ZRCS also procured goats under a programme called “Support to agriculture diversification and food security” (Interview, 2:2).

- b) *Land O’Lakes International Development – NGO:*** Through an initial 18-month cooperative agreement, with USAID/OFDA, Land O’Lakes International Development between 2010 to 2013 assisted 664 vulnerable households in disaster-prone areas of Kazungula and Sesheke districts by procuring goats on their behalf as a means of restoring assets and livestock productive capacity (Land O’ Lakes, 2014). Though the level of destruction posed to the environment by goats was not well assessed, goats were seen as a plausible option because they performed fairly better in drought prone areas and were found to be resistant to most diseases that easily affected cattle (Interviews, 2:2; 5:2; 5:3)

The program distributed over 3,600 vaccinated goats to 664 households, and 62 percent of the beneficiaries were women. Land O’Lakes supported the formation of 56 predominately female goat producer groups to meet the unique needs of women farmers and encouraged them to become leaders (Land O’ Lakes, 2014). Through the program’s support, over one third of households’ benefiting from the program are now better prepared to withstand droughts, flooding, market shocks and other unforeseen climate events (Land O’ Lakes, 2014).

- c) *Action Aid*²⁹ – NGO:** With support from the International Fund for Agricultural Development (IFAD), financial investments were made to purchase small livestock in form of goats as a means to restoring livestock after the wiping out of cattle by diseases (Interview, 3:7).
- d) *Caritas Zambia:*** Like Land O’ Lakes and other cooperating partners such as Action Aid, Caritas Zambia also supports communities with livelihood opportunities to sustain them in times of crop failure. For instance, in 2009, 37

²⁹ ActionAid is an international non-governmental organization whose primary aim is to work against poverty and injustice worldwide

goats were given to a selected few (about 25 households) in Sikaunzwe as a pass on gift to 75 other households upon their multiplication (Interview, 5:5). By 2013 September, the total number of goats had multiplied to 400 and distributed to the target beneficiaries (Interview, 5:5).

- e) ***Disaster Management and Mitigation Unit – Government line agency:*** The DMMU operates as an entity under the Office of Vice-President. The DMMU created in 1994 envisions offering protection to the citizens of Zambia, their assets and the environments. The objectives for the DMMU's existence include:
- Putting in place preparedness measures that are suitable for managing disasters effectively and efficiently;
 - Putting in places measures that would ensure timely rescue of endangered life and reducing damage to property;
 - Putting in place measures and strategies that restore the social order of people affected by any form of disaster;
 - Lessening impacts of hazards and disasters on vulnerable communities, their assets and the environment in general;
 - Advancing preventive measures to mitigate negative impacts and effects and impacts of hazards as well as strengthening the countries capability to manage disasters; and
 - Coordinating disaster management activities to avoid duplication of efforts and resources at all levels of government (DMMU, 2005).

All mandates and objectives of the DMMU are enshrined in the Disaster Management Policy of 2005, (DMMU, 2005). At District level, the policy has conferred powers to the District Disaster Management and Mitigation Unit (DDMMU) in collaboration with district line agencies, NGOs and the private sector to carry out disaster operations expediently. Through these powers, flood responses of 2006/2007 and 2008/2009 of Kazungula were acted upon expediently to support communities affected with floods (Interview, 2:1). Additionally, the enactment of the Disaster Management Act in 2010 has given legislative authority the DMMU at all levels – national, provincial, district and

satellite to prevent, mitigate and respond to disasters as may be seen necessary (DMMU, 2005).

At district level, i.e. Kazungula and Sesheke, the DMMU activities are undertaken by District Disaster Management Committees (DDMC), which is a composition of different representations of government departments and line ministries working in the districts (Interviews, 2:5; 2:6).

6.3.4 Leadership

- a) *Land O' Lakes:*** In Sesheke district, Land O'Lakes has been linking communities to markets for their crops and stock produce through leaderships and advocacy. In Mwandi, Masese and Moando vet camps, livestock farmers have been linked to ZAMBEEF by agricultural and livestock department to assist them sell their produce (Interview, 3:21).
- b) *Zambia National Farmers Union:*** The Zambia National Farmers Union (ZNFU) is also supporting local farmers' interests through leadership and advocacy. ZNFU is a member driven organisation that offers its services to small scale farmers in form of securing bank loans on farmers' behalf; train small scale farmers on how to adapt their farming methods to changing weather patterns; and link farmers to markets and market opportunities. The organisation also acts as a mouth piece for farmers in lobbying for government support and response to farmers' agricultural needs (Interview, 3:17). The union, however, lacks sufficient human resources to reach all the farmers in the districts. The Sesheke office, for example, has one official manning the entire District. Moreover, the whole of Southern Province (where Sesheke has been aligned) only has 4 Union Coordinators – Choma, Kalomo, Livingstone and Sesheke, posing a challenge of actual coverage (Interview, 3:17).

6.4 Linkages between Meso-level Institutional Adaptation Support and Adaptation Strategies

As shown in the preceding sections, the four main types of support i.e. information and training, technological advancement, finance investments and leadership have been used by meso-level institutions to support communities build adaptive capacities. This is because they potentially give direction to how the five distinct adaptation strategies relevant for use at local level will unfold. In this section, the five analytical categories of adaptation strategies and their combinations will be discussed using Agrawal's (2008) framework. These distinct adaptation strategies relevant for use at local level include mobility, diversification, communal pooling, storage and exchange (Agrawal, 2008) as shown in Table 6-5. However, discussions at this point have only focused on establishing what interventions meso-level institutions claim to be supporting people in the Simalaha area. Whether or not there is a theoretical connection between meso-level support and people's adaptation strategies in practice, and whether farmers and inhabitants of the Simalaha area actually feel that they have been supported will be discussed in Chapter 7.

Table 6-5: Types of institutional support disaggregated into adaptation outcomes

Types of meso-level support	Specific type of support	Household adaptation strategies	How meso-level interventions theoretically supports people's adaptation strategies
Information and training	Information on shifting farming patterns from growing maize to adopt other drought tolerant crops such as cassava and millet	Diversification	<ul style="list-style-type: none"> - Potentially diversifies crop production e.g. instead of growing maize alone, farmers grow other crops such as sunflower, cassava and sorghum - In some cases diversification may lead to replacing one kind of crop e.g. maize with another crop such as cassava or sunflower
		Exchange	<ul style="list-style-type: none"> - Potentially supports exchange strategy, by providing for new crops than can be marketed
	Information on shifting cultivation methods from conversional farming method to conservation agricultural method	Diversification	<ul style="list-style-type: none"> - Potentially diversifies crop production methods to improve on nutrient and moisture retention in drought prone areas
Technological advancement/	Introduction of goats	Diversification and Mobility	<ul style="list-style-type: none"> - Introducing a new type of livestock production e.g. from cattle production to goat

Finance Investment			<ul style="list-style-type: none"> production as a drought and disease tolerant option - Indirectly constrains mobility by replacing cattle (mobile production system) with goats.
	Growing fodder for livestock	Diversification, Exchange, Communal pooling and storage	<ul style="list-style-type: none"> - Supports new form of animal feed for local livestock that can be grown communally and marketed to earn incomes. - Fodder also serves to control grazing
	Water infrastructural projects	Communal pooling; Storage	<ul style="list-style-type: none"> - Supports availability of water in drought prone areas through borehole drilling and mechanisation - Small dams provide for water harvesting opportunities used for livestock watering and gardening
	Treadle pumps	Diversification, Exchange, Communal pooling and storage	<ul style="list-style-type: none"> - New technology supported to improve crop production through irrigation
Finance Investment	Support of food, shelter and water in camps for people affected by floods	None	<ul style="list-style-type: none"> - Short-term emergency assistance. Provides basic survival in extreme situations, but does not support long-term adaptation strategies.
	Support of food for people affected by droughts		
Leadership	Relocating people from flood prone areas to drier lands	Mobility	<ul style="list-style-type: none"> - Supports movement of communities to drier lands away from flood prone areas. - In a way, also potentially constrains mobility by placing people in a favourable environment for crop farming purposes.

a) Diversification: In general, the importance of increased diversity lies in promoting greater flexibility because it allows more possibilities for substitution between opportunities that are in decline and those that are expanding (Ellis, 1999). As many climatic changes most directly affect agricultural production, diversification on agricultural productivity through development and adoption of drought and heat resistant crop varieties, shifting of planting dates or changes in crop mix, has taken the centre stage in most policy discussions (Lobell, et al., 2008; Macours, et al, 2012). In the Simalaha area, diversification that involve farm-level innovations, such as introducing new hybrid crops and new varieties of livestock, has been supported by several NGOs including Land O' Lakes,

Zambia Red Cross Society and Zambia Agricultural Research Institute (Interviews, 2:2; 3:1; 5:3; 5:6). Further, some farmers growing rain-fed crops in the flood prone areas of the Simalaha have diversified the location of farm plots to Namapande and other drier lands to take advantage of suitable amounts of rainfall required for crop productivity (Interview, 2:1). Some have also taken on non-farm enterprises that are less sensitive to climate.

- b) *Exchange:*** Exchange is a factor of gaining access to markets. Not only does exchange promote adaptation to environmental risks, it is also important for specialisation, trade and wellbeing gains that result from specialization and trade at multiple scales (Agrawal, 2008). In the Simalaha area, Land O' Lakes supported communities to grow animal feed with the hope of marketing it to pastoralists and local farmers to earn incomes. Similarly, some new crop hybrids adaptable to the climate are grown for sale.
- c) *Mobility:*** In the context of responding to environmental risks, mobility is a strategy of movement used to address risks in a given location (Agrawal, 2008; Agrawal and Perrin, 2008). Tendencies of cultivation, productivity and habitation tend to shift with occurrence of spatio-temporal variations. It is important to note, however, that different community groupings will react differently to mobility as an adaptation measure if costs of moving outweigh the benefits. In the Simalaha area, the strategy of mobility was applied to relocate families affected by floods from Kasaya area to Namapande resettlement area following the 2008 floods (Interview, 2:1). In a way, placing people in a favourable location like Namapande would potentially constrain mobility once people are comfortably settled in the new location.
- d) *Storage:*** In the context of climate change, storage as an adaptation measure is relevant to individuals and communities to address food shortages as well as water scarcities (Agrawal, 2008). In areas of less rainfall and longer drier periods, storing sufficient water in dams and reservoirs for irrigation may reduce crop

failure even though, longer drier periods may mean that soil water conservation measures may fail to retain soil moisture effectively for crops (IWMI, 2009).

e) **Communal pooling:** Is a technique that cuts across households. Communal pooling refers to adaptation responses involving joint ownership of assets and resources; sharing of wealth, labour, or incomes from particular activities across households, or mobilization and use of resources that are held collectively during times of scarcity (Agrawal, 2008). In the Simalaha area, small dams built for communal use provide for water harvesting opportunities used for livestock watering and gardening.

6.5 Key Meso-level Institutional Constraints of Executing Climate Change Adaptation Support

There are a number of constraints affecting meso-level institutions in offering their support for climate change adaptation to people affected by floods or droughts. Some of the limitations include inadequate funds, lack of resources for mobility to carry out extension work, poor coordination and collaboration amongst different organisations working on similar projects, limited capacities in training and human resource, and disconnect between national policies and local climate change adaptation needs. Some of the key constraints reported during the study that hinder effective meso-level institutional support for floods and droughts adaptations are discussed below:

6.5.1 Limitations in Funds

Local government officers and technical line agencies at district level with knowledge of local conditions and knowledge of areas with the most need for climate change support would make plans through their District Development Coordinating Committee (DDCC) meetings. Whilst plans made at district level are backed with budgetary needs, the centralised funding system of disbursing national funds does not cater for all planned projects as seen necessary by local experts for development in general, but also improve support to climate change adaptation (Interviews, 2:1; 2:3; 2:5; 2:6; 3:1; 3:2; 3:4 3:10; 5:2; 5:3). In some cases, some planned activities do not get funded all together – either they are not seen as a priority by central government all together, or other projects not in

the initial local plans are promoted in place of projects planned for at district level. This challenges local experts at district level to implement planned climate change adaptation activities and also frustrates many efforts made to improve local livelihoods. For example, lack of government funding to train and support people in bee keeping activities by the Forestry Department has limited the number of people supported in bee keeping activities as alternative livelihood opportunities used to keep people from relying on the forestry for survival (Interviews, 5:2; 5:3).

Moreover, limitation in budgetary allocations for implementing local climate change adaptations has implications on how communities' finances will be made available for local climate change adaptation requirements. This implies that some people within communities are left out from general support which is supposed to target all people in communities. For instance, this occurs when a small number of people are supported with food subsidies, crop input or livestock, while the majority do not get the support due to limitations in funding (Interviews, 1:1; 1:3).

6.5.2 Limitations in Mobility

Due to the rough terrains and vastness of the Simalaha area, reliable transport is required to improve extension work for agricultural and forestry personnel and other experts offering support to local climate change adaptation and other developmental projects, in general. However, most technical experts with knowledge of community problems fail to support communities residing in places not close to the main road because they lack transport for mobility. For instance, extension work for the forestry department in Kazungula to monitor interferences on the forestry has been a challenge because the department has no field vehicle to go round the district (Interviews, 5:2; 5:3). Monitoring of activities taking place on the ground is usually supported through efforts of other departments that provide transport to the department when travelling to do work in the same direction when extension work for the forestry department is required (Interviews, 5:2; 5:3).

The agricultural extension office for Kazungula relies on one motorbike manned by one extension officer expected to offer outreach services to the vast areas in the Simalaha

area (Interview, 2:4). Moreover, despite the availability of one motorbike used for the entire district, there are hardly any resources for fuel required to move the motorbike, proving more challenging for extension work to be effective (Interview, 2:4).

6.5.3 Poor Meso-level Institutional Coordination and Collaboration

There are a number of meso-level institutions working on similar projects in the Simalaha area. For example, both FAO through Red Cross Society of Zambia under an EU funded programme called ‘Support to agriculture diversification and food security’ and Land O’Lakes support communities with goats as drought resistant livestock suitable for the Simalaha area (see preceding sections). Similarly, both the Ministry of Agriculture and the Meteorological Department support communities with climate data for crop forecasting each farming season. The problem however is that institutions working on similar projects and activities work independently supporting same communities – meaning that efforts are duplicated and may sometimes offer conflicting views especially when it comes to offering advice that directly affects the development of communities (Interview, 5:1).

In some cases, failure to collaborate and work in conjunction with existing institutions in supporting similar causes has been a source of conflict. For example, an NGO called Green Pop implemented a project of tree planting in Kazungula District similar to what the mandate of the Forestry Department is. The implementation of tree planting was done without prior consultation and recognition of existing tree planting efforts done on the ground. Due to failure in following standard procedures and failing to recognize the Forestry Department as the custodian of the forest in doing their work, the Green Pop project created conflicts which were only resolved following lengthy discussions on each institution’s roles and what each institution was mandated to do. A Memorandum of Understanding was signed between the Forestry Department and Green Pop Green as a way of formalizing all agreements laid out (Interview, 5:3).

With the use of concerted efforts, putting up funds together from different organisations working on similar activities would increase the number of people supported and improve on effectiveness of implementation and monitoring efforts.

6.5.4 Disconnect between National Policies and Local Climate Change Adaptation needs

When budgets are made at district level, decision on actual activities to be funded are made at the central level of government. As a consequence important programmes requiring immediate implementation for local development end up not getting the required funds or funding is usually limited. As a result, implementation of activities becomes extremely challenging. In some cases, funded projects do not address real issues affecting communities on the ground (Interviews, 2:5; 3:1; 3:10; 5:3).

6.6 Conclusions

Although categories of meso-level institutions – public, civic and NGOs differ in structure and their functionality, this Chapter has shown that all three categories support adaptation to climate change in the Simalaha area. However, their emphasis on the type of intervention provided differs. Public institutions have strong emphasis on information support. For instance, the agricultural, forestry and meteorological departments use information and training to change mind sets of people's practices in agriculture and natural resources management in the Simalaha to enhance adaptive capacities. Public institutions also emphasise technological advancement such as conservation agriculture and water infrastructural projects. Financial investments and leadership is almost exclusively done by donors and NGOs, supporting hard adaptation projects and offering support on how to manage the projects.

The most supported type of intervention in the Simalaha area is information and technological advancement. Information and training is particularly important because, to some extent, knowledge has the potential to structure people's ability to respond appropriately by enabling them to anticipate long-term risks and make appropriate adjustments to increase their adaptation to perceived environmental conditions. Information and training also makes it easy for inhabitants to take on new technologies such as conservation agricultural practice and drought resistant hybrid crops to improve on adaptive capacities for local contexts.

With regards types of adaptation strategies, diversification and exchange strategies take the lead. Mobility on the other hand is constrained because moving with livestock is discouraged in order to control animal diseases.

Most development projects including climate change projects are externally channelled. This means that, interventions that get to communities are not necessarily based on analysis of local adaptation needs, but what donors perceive would enhance adaptive capacities of communities. For example, if their funding does not cover water infrastructural projects, NGOs and donors with funding to support livestock production will not change their plans to support water infrastructural projects even if communities' greatest needs are water resources and not livestock. In a limited number of cases, bottom-up approaches have been used to draw on farmers own ideas of what would enhance adaptive capacities to agriculture and general livelihood.

There may be several means used to improve adaptive capacities for communities, and also different types of support may be used to achieve same adaptation strategies. However, the success of adaptation strategies depends in part on whether social contexts embrace proposed strategies (Agrawal, 2008). For instance, if in doubt of whether or not it is beneficial to shift periods of farming to early days in the season, communities may go against advice provided by the meteorological department especially if previous advice has been ineffective. Moreover, institutional contexts through which adaptation strategies are pursued play an important role (IIED, 2013). For instance, there is some evidence that strengthening farmers' capacity to adapt usage of conservation technologies can be mediated by social factors such as social relations, institutions and organisations. Where successful, these responses encompass uncorrelated risks associated with flows of benefits from different classes of assets (Agrawal, 2008).

CHAPTER 7

RECIPIENTS OF SUPPORT FOR CLIMATE CHANGE ADAPTATION

7. Introduction

This Chapter answers the third research question which is, “who benefited from the meso-level adaptation interventions in the study area?” Methodologically, both quantitative and qualitative approaches were used to show which categories of community groups received support for climate change adaptation in the Simalaha area.

7.1 Characteristics of Survey Respondents

Understanding the sex, age, level of education, period of residence and wealth status of the respondents provides great insights in determining whether or not demographic characteristics had an influence in the way individuals or groups accessed support from meso-level institutions in the Simalaha area. In societies where education is limited, for example, the level of literacy and other social factors such as income can influence the way support for adaptation is accessed. Sex is also critical at times as it may show variations on how males and females will respond to or use the support provided.

Table 7-1 shows the distributions of respondents by key background characteristics that includes; sex, age, level of education, and period of residence, economic activities and level of well-being. In terms of gender, 105 respondents (52.5 percent) interviewed were males, while 95 respondents (47.5 percent) were females. With regards to age of household heads, the highest proportions were middle aged and senior people, aged between 26 and 44 years old and 45 and 65 years old, respectively. Household heads aged between 26 and 44 years old accounted for 66 respondents (33 percent), whereas those aged between 45 and 65 accounted for 75 respondents (37.5 percent).

Table 7-1: Characteristics of Respondents

Sex	Frequency	Percent
Male	105	52.5
Female	95	47.5
Total	200	100
Age	Frequency	Percent
Below 18 years old	11	5.5
Between 18 and 25 years old	9	4.5
Between 26 and 45 years old	66	33
Between 46 and 60 years old	75	37.5
Above 60 years old	39	19.5
Total	200	100
Education	Frequency	Percent
None	25	12.5
Some Primary education (but not finished grade 7)	62	31
Completed Primary education (Grade 7)	52	26
Completed Lower Secondary education (Grade 8-9)	47	23.5
Completed Upper education (Grade 10-12)	12	6
College/University/Tertiary/	2	1
Total	200	100
Period of Residence	Frequency	Percent
0 to 1 year	1	0.5
1 to 2 years	2	1
3 to 5 years	21	10.5
6 to 10 years	21	10.5
11 to 15 years	30	15
16 to 20 years	18	9
More than 20 years	52	26
Born in the Simalaha area	55	27.5
Total	200	100
Economic Activities	Frequency	Percent
Farming	140	70
Fishing	16	8
Informal employment	2	1
Formal employment	1	0.5
Trades (charcoal burning, beer brewing, selling livestock etc.)	41	20.5
Total	200	100
Level of well-being	Frequency	Percent
Rich/Non-poor	70	35
Middle-poor	63	31.5
Poorest	67	33.5
Total	200	100

In terms of levels of education, it was found that household heads had low levels of education with the majority falling in the bracket of primary education. Sixty-two (62) respondents (31 percent) reported that they had attained some primary education despite not completing grade 7 (i.e. primary education), whereas 52 respondents accounting for 26 percent reported that they completed primary education. Only 2 respondents (1 percent) reported that they attained tertiary education. This shows that the level of education among respondents was very low.

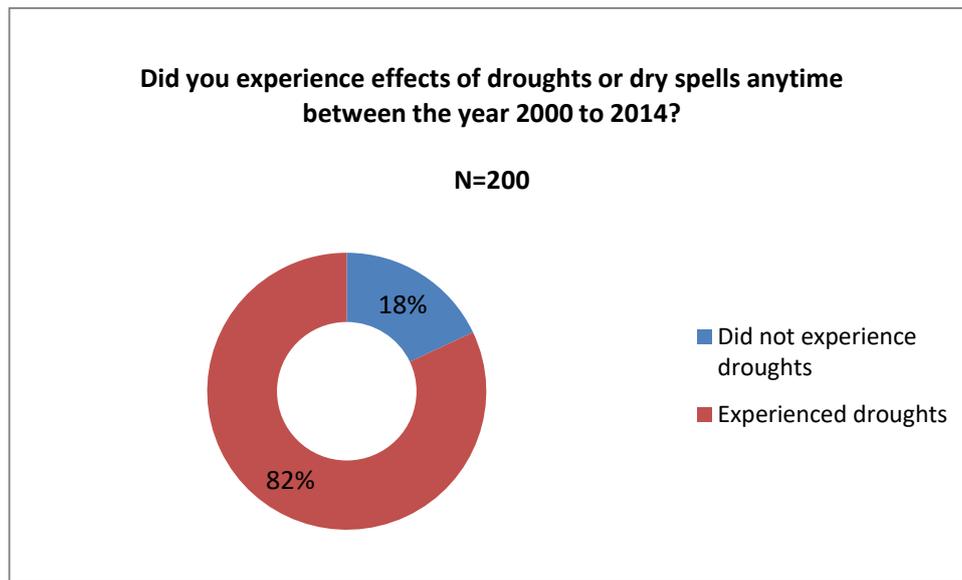
With regards to period of residence in the Simalaha area, 55 respondents (27.5 percent) reported that they were born in the Simalaha area whereas 52 respondents (26 percent) reported that they had lived in the Simalaha area for than 20 years. Very few surveyed households reported that they had lived in the Simalaha area for less than 2 years.

The main economic activity for households surveyed in the Simalaha area was found to be farming, accounting for 140 responses (70 percent). With regards levels of well-being i.e. wealth status, there were almost equal number of households in all levels of well-being. Non-poor interviewed households accounted for 70 respondents (35 percent) whereas the middle-poor and the poorest households accounted for 63 respondents (31.5 percent) and 67 respondents (33.5 percent), respectively.

7.2 Experiences of Droughts among Respondents

The household questionnaire survey showed that, out of the 200 people interviewed in the Simalaha area, 164 respondents (82 percent) reported that they had been experiencing droughts or got affected by droughts between 2000 and 2014. Further, 36 respondents (18 percent) reported that they did not experience droughts or experience any effects of droughts in the Simalaha area between 2000 and 2014 (Figure 7-1).

Figure 7-1: Households experienced/affected by droughts in the Simalaha area of Zambia



For respondents residing in the Simalaha area, this result is least surprising. According to studies, (Thompson, 1993; Lekprichakul, 2008; WaterAid, 2010), the last two decades have been characterised by droughts in varying proportions with Region 1³⁰ being the most affected. This perception was also reflected during the community focus group discussions held in Kawana and Mwandu communities:

“...We started observing dry spells in 1995 up until now. In 1995, there was a severe drought that resulted in extreme crop failure. In 1996, there was another drought. In the years that followed, streams and rivers started getting dry as early as May and remained dry the rest of the dry season”.

– (Focus group discussion, 1:2)

³⁰ Region 1 covers the Southern part of the country and experiences low annual average rainfall of less than 800 mm. Rainfall trends show that since 1970 - 2000 there has been a decreasing trend of annual rainfall with a mean annual rainfall of 684 mm, and highest rainfall of 1048 mm recorded in 1977/78 rainy season and lowest of 428 mm in 1994/95 rainy season. In general, rainfall deficits and periods of dryness are common and therefore Region 1 is considered to a drought prone risk area. Region I exhibits this greater variability and tendency towards a dryer climate because the ITCZ has a lower influence on rainfall in this region.

“... We started experiencing droughts in the early 2000s. I can particularly say drought years in our area were 2002, 2003, 2005, 2012 and 2013. These years are significant because crops dried up ... small rivers, water dambos, wells and boreholes also started drying out. To date, the drying up of water sources is a feature of this area that we now live with”. – (Focus group discussion, 1:1)

In some years e.g. 2001/2002 and 2004/2005 rainy seasons, heavy downpours were often followed by dry spells of three weeks or more, causing crop failure (WaterAid, 2010; Ministry of Finance, 2013). The Simalaha area being dominated by communities that highly depend on agriculture and natural resources for survival, recurrent droughts reduce means of livelihood, making it harder for farmers to survive in the subsequent year or season.

However, as shown by the results, some respondents stated that they did not experience droughts. This is because they may not have resided in the Simalaha area long enough to experience the droughts or, they were too young to comprehend the occurrence of droughts.

Proportions of respondents that experienced droughts or got affected by droughts between 2000 and 2014 were disaggregated according to demographic characteristics as shown in Table 7-2. Results show that 84 respondents (42 percent) of males and 80 respondents (40 percent) of females reported that they had been affected by droughts in the Simalaha area. This suggests that the experience of droughts is almost equally distributed among males and females, because differences in numbers of males affected by droughts from the females are minimal.

Although results do not say much about whether males or females carried the biggest burden of droughts, studies elsewhere suggest that women are the most affected (UN, 2009). One reason is that, predominantly, women especially in rural areas are more dependent for their livelihood on natural resources that are threatened by the climate (UN, 2009). For example, they depend on agriculture as the main economic activity and

also rely on money making ventures that depend on the environment (UN, 2009; AfDB, 2011). This increases women’s vulnerability to external shocks such as droughts, because impacts of climate change directly affect their sources of livelihood.

With regards to age, the age group that reported to have been most affected was between 46 and 60 years old accounting for 65 respondents (32.5 percent). With regards period of residence, people that had lived in the Simalaha area or those that were born in the Simalaha area reported that they experienced or had been impacted the most with droughts. This accounted for 43 respondents (21.5 percent) and 49 respondent (24.5 percent), respectively. This result suggests that the longer the period of residence or the older the respondent, the experience of droughts in the Simalaha area were also high.

Table 7-2: Proportion of respondents that experienced/affected by droughts in the Simalaha area of Zambia disaggregated into demographic characteristics

Sex	Frequency		Percent	
	Yes	No	Yes	No
Male	84	21	42	10.5
Female	80	15	40	7.5
Total	200		100	
Age	Frequency		Percent	
	Yes	No	Yes	No
Below 18 years old	11	0	5.5	0
Between 18 and 25 years old	9	0	4.5	0
Between 26 and 45 years old	55	11	27.5	5.5
Between 46 and 60 years old	65	10	32.5	5
Above 60 years old	24	15	12	7.5
Total	200		100	
Education	Frequency		Percent	
	Yes	No	Yes	No
None	20	5	10	2.5
Some Primary education (but not finished grade 7)	48	14	24	7
Completed Primary education (Grade 7)	45	7	22.5	3.5
Completed Lower Secondary education (Grade 8-9)	39	8	19.5	4
Completed Upper education (Grade 10-12)	10	2	5	1
College/University/Tertiary/	2	0	1	0
Total	200		100	
Period of Residence	Frequency		Percent	
	Yes	No	Yes	No
0 to 1 year	1	0	0.5	0
1 to 2 years	2	0	1	0
3 to 5 years	15	6	7.5	3
6 to 10 years	15	6	7.5	3
11 to 15 years	23	7	11.5	3.5

16 to 20 years	16	2	8	1
More than 20 years	43	9	21.5	4.5
Born in the Simalaha area	49	6	24.5	3
Total	200		100	
Economic Activities	Frequency		Percent	
	Yes	No	Yes	No
Farming	119	21	59.5	10.5
Fishing	12	4	6	2
Informal employment	2	0	1	0
Formal employment	1	0	0.5	0
Trades (charcoal burning, beer brewing, selling livestock etc.)	30	11	15	5.5
Total	200		100	
Level of well-being	Frequency		Percent	
	Yes	No	Yes	No
Rich/Non-poor	59	11	29.5	5.5
Middle-poor	48	15	24	7.5
Poorest	57	10	28.5	5
Total	200		100	

With regards to levels of well-being, results show that there was not so much of a difference between people in the “non-poor” category and the “poorest” category in terms of experiencing droughts. The former accounted for 59 responses (29.5 percent), whereas the latter had 57 respondents (28.5 percent). As can be seen from Table 7-2, there are not big differences in numbers of people affected by droughts in different wealth groupings. This shows that the experience of droughts is equally distributed among the poor, the middle group and the non-poor, though variations exist on response strategies used between the better-off households and the poor households.

7.3 Recipients of Support for Adaptation to Droughts

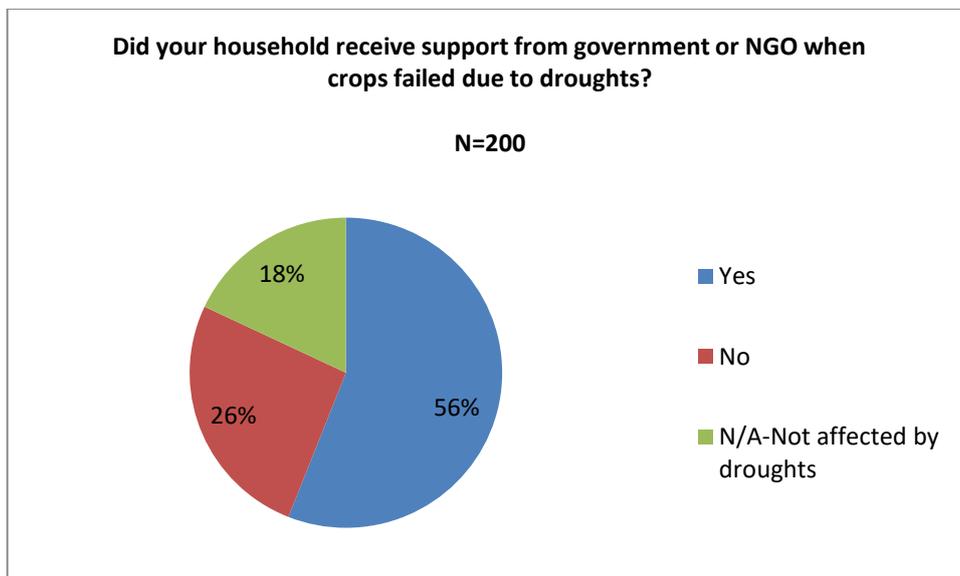
Drought has a significant impact on the well-being of communities in a given area. Being proactive towards adaptation to effects of droughts can therefore limit the social impacts to individuals, families and communities (Bruneau, 2013). In Chapter 6, it has been shown that meso-level institutions in the Simalaha area have on-going interventions to support droughts and floods adaptation. However, how best communities will adapt to changing climate is not only dependent on meso-level institutions devising interventions targeting floods or droughts adaptation, but also whether or not groups or individuals for which the support is intended have access to support rendered (Agrawal, 2008). In this

section, we analyse how demographic characteristics of households or individuals may influence access to meso-level institutional support for adaptation to droughts in the Simalaha area.

Of the 164 research participants (82 percent) that reported to have been affected by droughts between 2000 and 2014 (see Figure 7-1 above), the question of “Did your household get assistance from the government or NGOs at any point when your crops failed as a result of droughts?” was asked. This question covered support both for coping measures as well as adaptation interventions, because the complexity of explaining differences to respondents between coping measures and adaptation measures made it difficult to distinguish the two kinds of support at the time of data collection.

One Hundred and twelve (112) respondents, (56 percent) reported that they received support from meso-level institutions when their crops failed as a result of droughts. Fifty-two (52) respondents (26 percent) reported that they did not receive any support from meso-level institutions when their crops failed as a result of droughts (Figure 7-2).

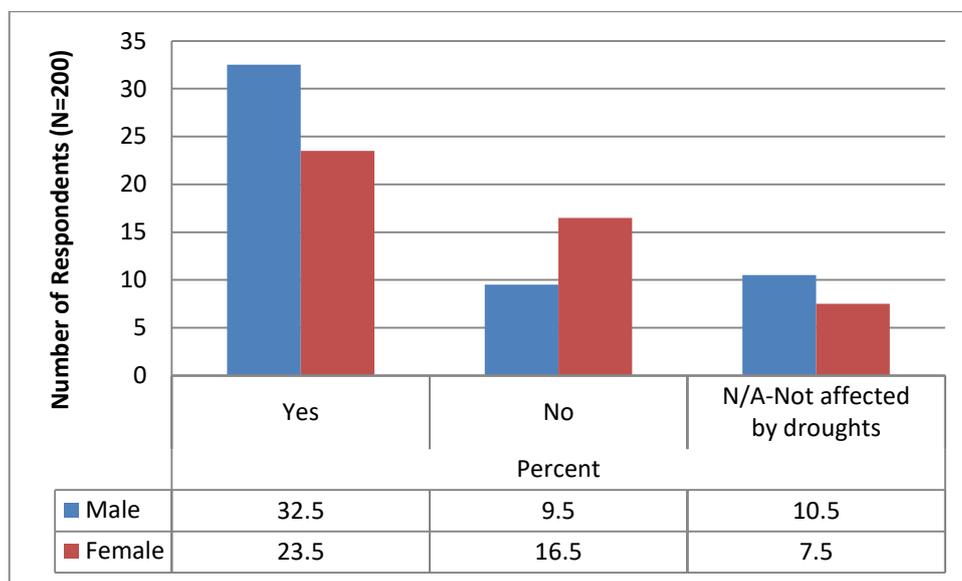
Figure 7-2: Households that received support for drought adaptation in the Simalaha area



Further, 36 respondents (18 percent) stated that they did not experience any effects of droughts in the Simalaha area between 2000 and 2014 (Figure 7-2).

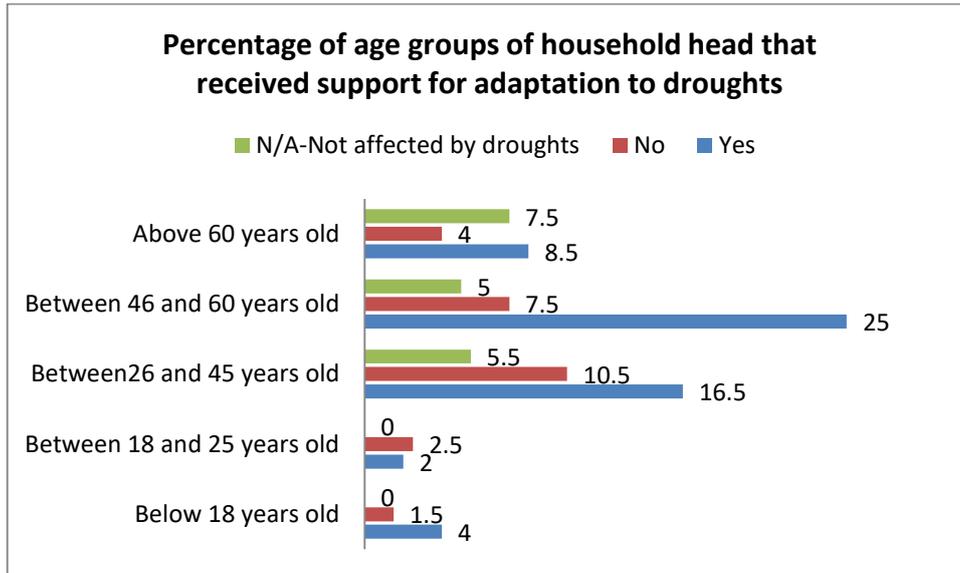
Proportions of respondents that received support for adaptation to droughts were disaggregated according to demographic characteristics as shown in Figures 7-3 to 7-5. Figure 7-3 shows that more males accounting for 65 respondents (32.5 percent) reported that they received support for adaptation to droughts as opposed to females that accounted for 47 respondents (23.5 percent). This shows that while support is meant for all members of communities, it is mostly skewed towards males in the Simalaha area.

Figure 7-3: Proportion of respondents that received support for adaptation to droughts in the Simalaha area disaggregated according to sex



With regards age groups and access to meso-level institutional support, 50 respondents (25 percent) stated that age groups between 46 and 60 years old received the most support. The least age groups that was reported to receive support for adaptation to droughts were those aged between 18 and 25 years old (Figure 7-4).

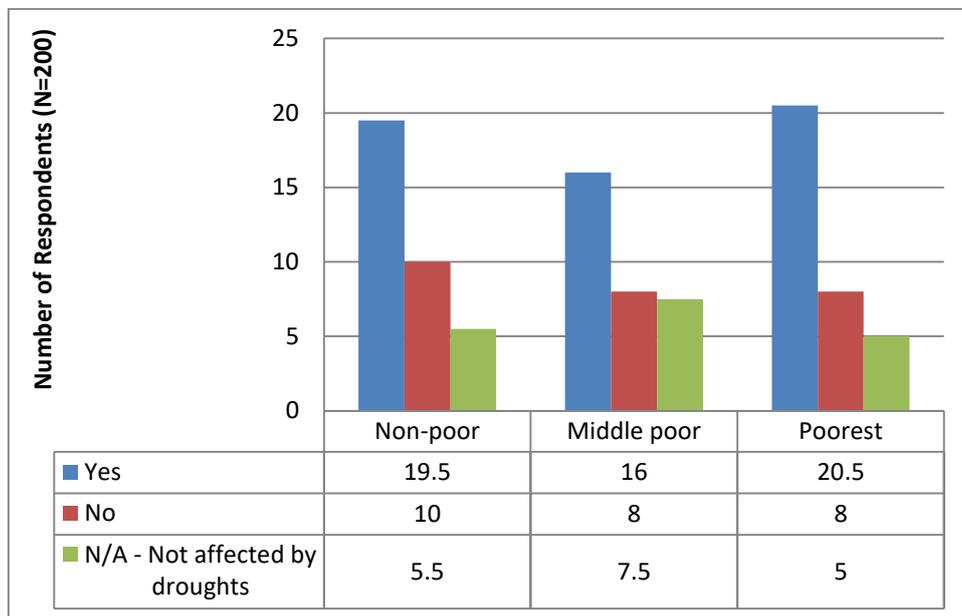
Figure 7-4: Proportion of respondents that received support for adaptation to droughts in the Simalaha area disaggregated according to age groups



It is not unexpected that the age group between 46 to 60 years old reported to have received the most support. Firstly, they comprised of the majority of respondents during the study. Furthermore, they were the majority that reported to have experienced droughts in the Simalaha area. Reckoning, the age group that comprised the most respondents would also report to have received support the most because they were in the majority.

With regards to levels of well-being, the results show that there was not so much of a difference between people in the “non-poor”, the “middle poor”, and the “poorest” categories of households in terms of receiving support for adaptation to droughts when their crops failed (Figure 7-5). The “non-poor” households accounted for 19.5 percent whereas the poorest category accounted for 20.5 percent responses. Households in the category of “middle poor” were at 16 percent, which was slightly less than the responses reported by the “non-poor” and the “poorest” categories (Figure 7-5).

Figure 7-5: Proportion of respondents that received support for adaptation to droughts in the Simalaha area disaggregated according levels of well-being



This result shows that people claim to experience droughts equally, and they also get support almost equally, with a slight advantage to the poorest. This suggests that everyone that is affected by droughts in the Simalaha area is principally given equal amounts of support for adaptation. However, because poor people are not equally equipped to cope with and adapt to droughts and floods, this becomes a problem because it means that, relatively speaking, the poorest get less than the better off. Agrawal (2008) also pointed out that whilst droughts may affect everyone equally in a given community, the non-poor may sell their assets such as livestock to buy food whereas the poor with no livestock suffer more because they lack alternative assets to help them cope in difficult situations. Similar suggestions were expressed by one respondent during an in-depth interview, in the Simalaha are, that:

“Those with cattle would sell it to earn incomes that can be used to buy maize when crops fail as a result of droughts. Those that work at the lodge will rely on their salaries from the lodge to buy food. On the other hand, people that do not have livestock or any form of income generating activities will be most affected by droughts because they lack resources to

fall back on...” – (Middle aged community member in Sooka Community, 14th April, 2014 Interview)

This logic indicates that people from different wealth groups are affected differently by climate variations (Loster, 2008; Hallegatte et al, 2016) and response strategies vary among different wealth groups. Social differences, therefore, ultimately determine how well one will adapt following adverse climatic events faced in communities when no direct support is made available for adaptation.

However, results also show that few incidences exist where support is given more to the poor than the non-poor in society. According to one community leader in Sikuzu Community:

“...there are differences in access to institutional support among different people from various wealth groups, ... During periods of drought, the poorest, very old and weak members of society are considered first when food and other relief packages are being distributed. If the programme requires that people offer some labour input to access support, the poorest do not even need to work for food being distributed as it is just given to them for free”. – (Community leader in Sikuzu Community, 13th April, 2014 Interview)

On the other hand, in instances where people in the non-poor category are not included as beneficiaries of the support, they have found loopholes to gain access to the support meant for the vulnerable in communities. For example, people in the non-poor category of well-being also form part of the local elites that often engage with external organisations with interests in supporting community development. As a result, opportunities of access to support are opened up in their favour when interacting with meso-level institutions because such interactions provide opportunities for elites to also benefit from meso-level institutional support. During an unspecified drought year in Mwandu Central, it was heard during a focus group discussion that the distribution of food packages, for instance, was easily hijacked by the ‘*indunas*’ because they used

contacts to solicit for support meant for all community members and abused their authority by gaining access to support that should have benefited the entire community.

“...most people did not benefit from the support because people entrusted with redistributing foodstuffs kept most of it for themselves and were selective in the way they distributed”. – (Focus group discussion, 1:1)

Similarly, the Farmer Input Support Program works best for people with contacts to institutions because they have first-hand information of the times when ‘start-up’ fees to join cooperatives would be required; hence may prepare their fees in time.

“...They tell us late about paying our membership fees to the cooperative so that we are supported with seeds and fertilizers, yet others with friends in the cooperative will have known about the dates’ way in advance. This makes us fail to make payment because money cannot be found within a shortest possible time”. – (Female community member in Mwandi-Central, 13th April, 2014 Interview)

Poor groups of people with limited funds to finance their membership essentially lose out on such opportunities because they fail to quickly raise required funds to access the support. As articulated by Agrawal (2008), this scenario shows that groups and individuals with access to institutions are better placed to be supported easily than do individuals and groups that have no access to meso-level institutions.

7.4 Specific Support Received for Adaptation to Droughts

As shown in Chapter 6, some of the interventions implemented by meso-level institutions to support adaptation to droughts include support of climate tolerant crops and fertilizer inputs, support to livestock restocking programmes, advice on conservation farming, support to alternative forms of livelihoods and resettlement support (see Chapter 6 for details). With regards to actual support received for drought adaptation, Table 7-3, shows different kinds of support rendered by different institutions and the proportions of respondents that received it and/or did not receive it.

Table 7-3: Specific support received for droughts adaptation in the Simalaha area of Zambia

Adaptation support	Response	Frequency	Percent
Support of food packages	Yes	112	56
	No	52	26
	N/A – Not affected by droughts	36	18
Financial support	Yes	2	1
	No	162	81
	N/A – Not affected by droughts	36	18
Crop input (fertilizer and seed)	Yes	2	1
	No	162	81
	N/A – Not affected by droughts	36	18
Advice on coping measures (e.g. crop diversification)	Yes	16	8
	No	148	74
	N/A – Not affected by droughts	36	18
Advice on use of conservation farming	Yes	86	43
	No	78	39
	N/A – Not affected by droughts	36	18
Advice on fertilizer use	Yes	14	7
	No	150	75
	N/A – Not affected by droughts	36	18
Advice on winter cropping and cultivating dump areas	Yes	20	10
	No	144	72
	N/A – Not affected by droughts	36	18
Livestock restocking support	Yes	20	10
	No	144	72
	N/A – Not affected by droughts	36	18

As can be seen from Table 7-3, the most supported intervention when crops failed as a result of drought, was food packages, accounting for 112 responses (56 percent). Results of the focus group discussions also show that food support is one of the coping interventions used by meso-level institutions following droughts:

In 2005 people affected by droughts in Mwandia were supported with various foodstuffs... we received maize, sorghum, wheat, cow peas and cooking oil, supported by Care International Zambia”. – (Community leader in Mwandia-Central, 13th April, 2014 Interview)

Support in the form of food packages is essentially a relief measure following droughts, and not an adaptation intervention. It is used as a first step towards relieving people with the burden of crop losses, following drought occurrence. Meso-level institutions’ primary

concern is to support communities with basic necessities of life as a coping intervention. Therefore, food support is usually the primary form of aid used as a moral necessity for humanitarian relief against food insecurities resulting from persistent dry spells and droughts.

The other major form of support for drought adaptation used in the Simalaha area is the advice on conservation farming accounting for 86 responses (43 percent).

“...Advice on conservation agriculture is given to us by extension officers so that our crop yields can improve”. – (Focus group discussion, 1:4)

Conservation agriculture, as opposed to conventional methods, is increasingly being advocated for to improve crop productivity in drought prone areas because it is believed to improve crop productivity in water stress conditions (Arslan et al., 2013; FAO, 2012; Kandji et al., 2006; Marongwe et al., 2011). Conservation agriculture is defined under three main principles of minimum mechanical soil disturbance, permanent organic soil cover, and diversified crop species in rotation (FAO, 2012; Govaerts et al, 2009; Hobbs et al., 2008).

In the study site, agricultural extension officers and NGOs such as Land O’ Lakes, PUSH, Peace Parks, Caritas and the Zambia Red Cross Society have been going round communities providing advice on the use of conservation agriculture. This advice is used against the background that conservation agriculture offers benefits of increased crop productivity, reduced risk of crop failure and increased water harvesting potential (Marongwe et al., 2011).

The type of conservation agriculture advocated for in the Simalaha area is one of potholing using a hand hoe (Interviews, 2:2; 2:4; 3:1). This type of conservation agriculture entails digging of planting basins with dimensions of 0.2 meters in depth and 0.3 meters in length, using a hand hoe (CFU, 2009). The spacing between the basins is usually at 0.7 meters along the rows and 0.9 meters between rows (CFU, 2009). When cultivating the land, plant residues are supposed to be undisturbed on the surface to act

as permanent organic cover in the area between the basins (Nyanga, 2012). Further, during the focus group discussions conducted with community members of Namapande and Kawana, and the second consultative meetings conducted with institutional sources in Kazungula, it was reported that agricultural extension workers in the study area encouraged farmers to dig potholes in the fields in the months of May to August to have ample preparation time for the fields prior the commencement of the farming season (Interviews, 1:2; 1:4; 4:3).

Results in Table 7-1, also show that there were other forms of support received by communities when crops failed as a result of drought. These include livestock restocking, crop inputs – drought tolerant seed varieties and fertilizer inputs, advice on fertilizer use, advice on winter cropping and advice on coping measures such as crop diversification.

With regards to the livestock restocking programme, NGOs such as Land O’ Lakes and Africa Now, have interest in supporting adaptation to drought and have been supporting communities with goats (Figure 7-6) in the Simalaha area.

Africa Now and Sekute Conservancy Trust came up with a livestock restocking programme where goats were given to selected few households to grow and later pass on the offspring to other community members when the goats multiplied”. – (Focus group discussion, 1:3)



As shown in Chapter 6, organisations such as the Food and Agriculture Organisation (FAO), through the International Federation of Red the Cross Society, Land O’Lakes and Action Aid supported the purchase of goats to be distributed in different parts of the Simalaha area, including Kawana, Candela, Sikuzu, Namapande, Namangu and Sooka communities, under the livestock restocking programme. Support of goat production is used in the Simalaha area because goats are known to be much resistant to drought conditions as opposed to cattle. Other support for goat production came from the EU under the programme called “Support to agriculture diversification and food security”.

While community members in the Simalaha area may not have potential to realise huge sums of money from raising goats, the primary concern for NGOs such as Land O’ Lakes, has been centred on building resilience for supported communities and empowering them with sustainable options that in turn help to identify their development priorities and diversify livelihood options.

Crop inputs supported in the Simalaha area are fertilizers. Other support is in form of early maturing varieties of maize and drought tolerant crops such as cassava stems. As shown in Table 7-3, only 1 percent of the respondents reported that they received support of fertilizer and seeds as an adaptation intervention for adaptation to droughts. However, there was much more consensus from research participants during the focus group discussion held in Mwandu and Siankande Communities, respectively, that inputs were used as an intervention for supporting adaptation to droughts (Interviews, 1:1; 1:3). For example through the World Food Programme (WFP) and government efforts, communities have been supported with fertilizer inputs to improve crop outputs in drought prone areas (Interviews, 1:1; 1:3) and also as a country-wide intervention used to support crop production among subsistence farmers.

“... We were also supported with fertilisers and crop inputs to improve our yield because droughts were affecting our produce”. – (Focus group discussion, 1:3)

Households also reported that they are supported with advice on coping measures such as advice crop diversification to ensure that they started growing drought tolerant crops suitable in drought prone area. This accounted for 16 responses (8 percent).

Although meso-level institutions reported that they supported communities with information and advice about when to plant crops based on weather forecasts (see Chapter 6), this was not reported by households as support that they received from meso-level institutions. In the Simalaha area, it would be very relevant to advise farmers on when planting of crop should be especially when unpredictable rainfall patterns or drought conditions are expected for the region, to ensure that people to not experience extreme crop losses.

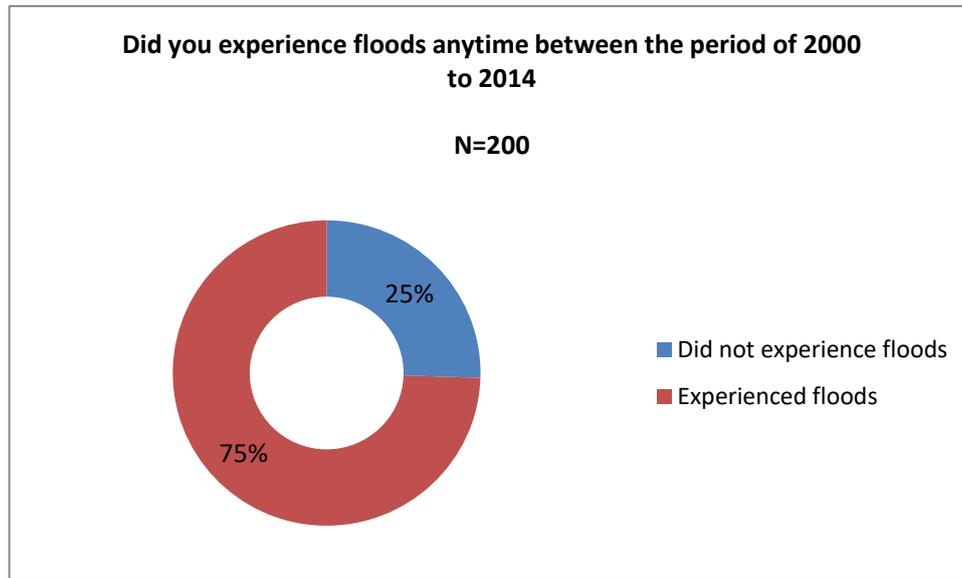
7.5 Experiences of Floods among Respondents

Of the 200 respondents interviewed during the survey, 149 respondents (74.5 percent) reported that they had experienced floods or had been affected by floods at some point between 2000 and 2014 in the Simalaha area. Fifty-one (51) respondents (25.5 percent) stated that they did not experience or get affected by floods at any point between 2000 and 2014, whilst residing in the Simalaha area (Figure 7-7).

The results of the focus group discussion conducted in Mwandu Community also showed that respondents experienced floods in the study area. Responding to the question, “Have you ever experienced or gotten affected by floods since you resided in this area?” The results show that respondents reported to have started experiencing floods dating back three decades ago:

“...We experienced extreme floods in 1978 and again 2010 when people had to be relocated to upper lands. Other floods that flooded part of our home dwellings were experienced in 2002, 2006 and 2008”. – (Focus group discussion, 1:1)

Figure 7-7: Households experienced/affected by floods in the Simalaha area of Zambia



Proportions of respondents that experienced floods or got affected by floods between 2000 and 2014 were disaggregated according to demographic characteristics as shown in Table 7-4. Results show that, there is an almost equal distribution between proportions of males (at 78 respondents or 39 percent) affected by floods to that of females (at 71 respondents or 35.5 percent).

With regards to period of residence, people that resided in the Simalaha area for more than 20 years and those born the in the Simalaha area accounted for the highest numbers of people to have been affected by floods, accounting for 48 respondents (24 percent) and 31 respondents (15.5 percent), respectively. However, people that resided in the Simalaha area for less than 5 years were found to have experienced or been affected by floods the least. This result suggests that people that have stayed longer in the Simalaha area had prior experiences of flood occurrences before the arrival of newer residents.

Table 7-4: Proportion of respondents that experienced/got affected by floods in the Simalaha area of Zambia, disaggregated into demographic characteristics

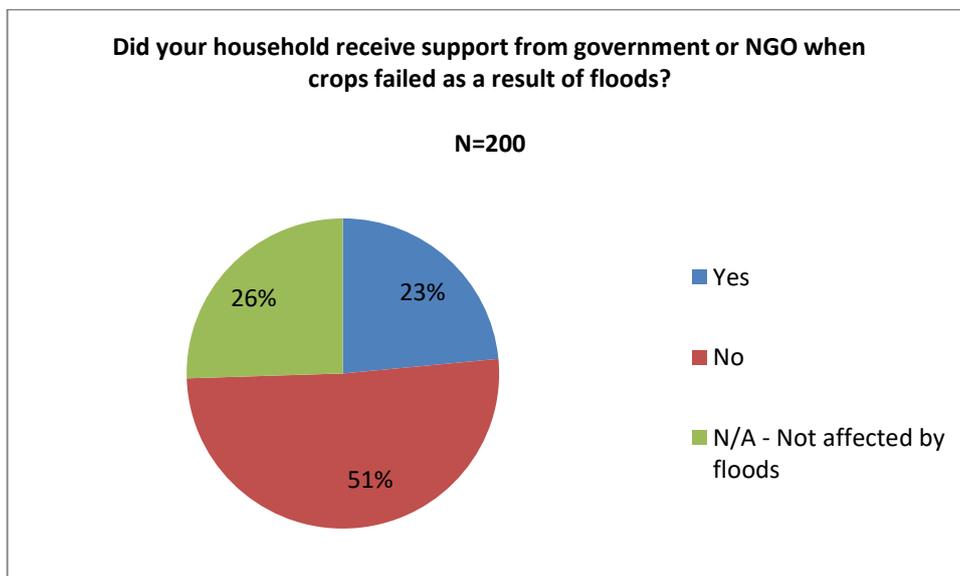
Sex	Frequency		Percent	
	Yes	No	Yes	No
Male	78	27	39	13.5
Female	71	24	35.5	12
Total	200		100	
Age	Frequency		Percent	
	Yes	No	Yes	No
Below 18 years old	9	2	4.5	1
Between 18 and 25 years old	7	2	3.5	1
Between 26 and 45 years old	52	14	26	7
Between 46 and 60 years old	50	25	25	12.5
Above 60 years old	31	8	15.5	4
Total	200		100	
Education	Frequency		Percent	
	Yes	No	Yes	No
None	20	5	10	2.5
Some Primary education (but not finished grade 7)	41	21	20.5	10.5
Completed Primary education (Grade 7)	48	4	24	2
Completed Lower Secondary education (Grade 8-9)	34	13	17	6.5
Completed Upper education (Grade 10-12)	5	7	2.5	3.5
College/University/Tertiary/	1	1	0.5	0.5
Total	200		100	
Period of Residence	Frequency		Percent	
	Yes	No	Yes	No
0 to 1 year	0	1	0	0.5
1 to 2 years	0	2	0	1
3 to 5 years	13	8	6.5	4
6 to 10 years	16	5	8	2.5
11 to 15 years	24	6	12	3
16 to 20 years	17	1	8.5	0.5
More than 20 years	48	4	24	2
Born in the Simalaha area	31	24	15.5	12
Total	200		100	
Economic Activities	Frequency		Percent	
	Yes	No	Yes	No
Farming	86	34	43	17
Fishing	31	4	15.5	2
Informal employment	15	6	7.5	3
Formal employment	0	0	0	0
Trades (charcoal burning, beer brewing, selling livestock etc.)	17	7	8.5	3.5
Total	200		100	
Level of well-being	Frequency		Percent	
	Yes	No	Yes	No
Rich/Non-poor	51	19	25.5	9.5
Middle-poor	48	15	24	7.5
Poorest	50	17	25	8.5
Total	200		100	

With regards to levels of well-being, results showed that there are no major differences between groups in terms of being affected by floods. People affected by floods in the non-poor category accounted for 51 respondents (25.5 percent) whereas the poorest category accounted for 50 respondents (25 percent). Further, the middle-poor category of well-being accounted for 48 respondents (24 percent). This shows that people in the Simalaha area are affected by floods the same way particularly those that reside in similar geographical locations prone to floods.

7.6 Recipients of Support for Adaptation to Floods

Responding to the question “Between 2000 and 2014, did your household get assistance from any government institutions or NGOs when you got affected by floods?”, only 47 respondents (which accounts for 23.5 percent) stated that they received support from government institutions and NGOs working in the Simalaha area when they got affected by floods (Figure 7-8).

Figure 7-8: Households that received support for flood adaptation in the Simalaha area



Fifty-one (51) percent of the respondents reported that they did not receive any support from meso-level institutions when they got affected by floods in the Simalaha area.

With about 149 respondents (74.5 percent) experiencing floods (see Figure 7-5 above), only less than one third (26 percent) of the respondents received support (Figure 7-8). This is because, extreme floods, which occurred in flood prone areas, with disastrous abrupt effects takes precedence in getting media attention and government support than do events that are subtle, long term and gradual (Christoplos et al., 2014; Mweemba et al., 2015).

“... We saw a lot of support from many government offices ... including the office of the District Commissioner after being affected by floods, because the media got wind that many people were being displaced ... from their usual dwellings”. – (Focus group discussion, 1:4)

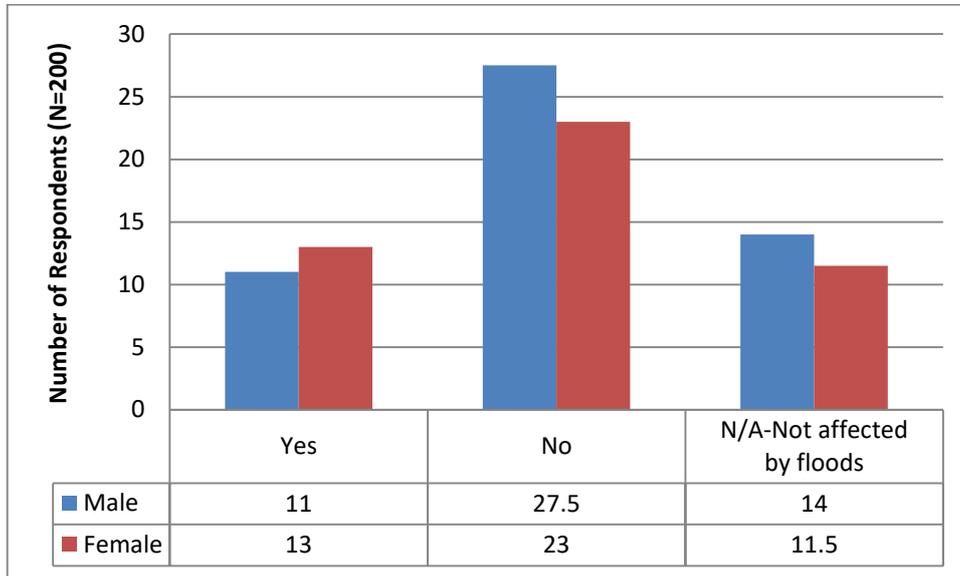
The case of the Kasaya floods of 2006 and 2008 are good examples of extreme events that attracted the attention of the national policy-makers and international organisations because the floods left a lot of people homeless and without basic necessities of life, undermining local livelihoods.

“... in 2008, water receding from uplands through the bushes to Kazungula affected areas of Kasaya, Kasensa, Kachabula, Bombwe and Sikaunzwe. Houses got flooded, leaving people homeless, hungry and with no property. ... As a temporally measure, government and NGOs responded by putting people at Kazungula Boma and helped them with food, clothing and shelter”. – (In-depth interview, 2:1)

Proportions of respondents that received support for adaptation to floods were disaggregated according to demographic characteristics as shown in Figures 7-9 to 7-11.

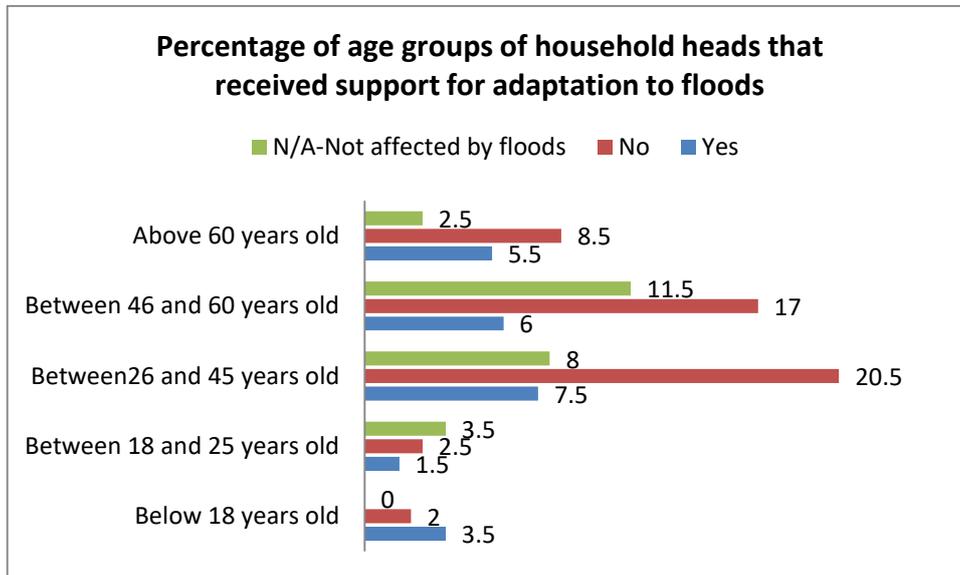
Figure 7-9 shows that more females at 26 respondents (13 percent) reported that they received support for adaptation to floods as opposed to males that accounted for 22 respondents (11 percent). It is important to note that there is a small difference between proportions of males and females accessing support from meso-level institutions; showing that support for adaptation to floods is equally distributed.

Figure 7-9: Proportion of respondents that received support for adaptation to floods in the Simalaha area disaggregated according to sex



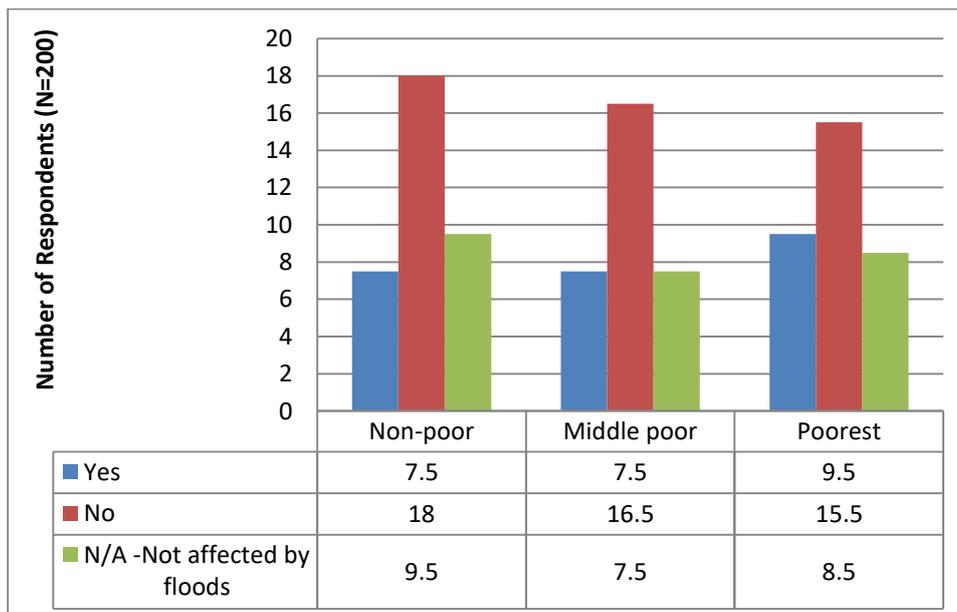
With regards age groups, differences between access to meso-level support and categories of age groups were small. For example, 7.5 percent and 6 percent of people aged between 26 and 45 years old and between 46 and 60 years old, reported that accessed support from meso-level institutions for adaptation to floods, respectively (Figure 7-10).

Figure 7-10: Proportion of respondents that received support for adaptation to floods in the Simalaha area disaggregated according to age groups



With regards categories of wealth rankings, 9.5 percent of the poorest groups in the Simalaha area reported that they received meso-level support whereas 7.5 percent of the non-poor and 7.5 percent of the medium poor groupings stated that they received meso-level support for adaptation to floods (Figure 7-11).

Figure 7-11: Households that received support for flood adaptation in the Simalaha area disaggregated into levels of well-being



Like support for adaptation to droughts, the majority of the poorest groups stated that they obtained meso-level institutional support more than the better-off categories of well-being. While that might be the case, we see that the difference between people that got support in the non-poor category, the middle group and the poorest category is marginal. Even though meso-level institutions may be alive to the fact that some people in the poorest category of well-being may not have same resources to respond to floods as much as the non-poor, everyone benefits from meso-level interventions when affected by floods.

7.7 Specific Support Received for Adaptation to Floods

Like droughts support, food packages were also the most supported adaptation measures used for floods adaptation in the Simalaha area of Kazungula and Sesheke districts. Results of the survey revealed that 39 respondents (19.5 percent) reported that they received food packages when their crops failed as a result of floods (Table 7-5).

Table 7-5: Specific support received for floods adaptation in the Simalaha area of Zambia

Support Received	Response	Frequency	Percent
Relocation to drier lands & provided with supplies	Yes	37	18.5
	No	112	56
	N/A- Not affected by floods	51	25.5
Food packages	Yes	39	19.5
	No	110	55
	N/A- Not affected by floods	51	25.5
Advice on coping measures	Yes	2	1
	No	147	73.5
	N/A- Not affected by floods	51	25.5
Advice to cultivate on higher grounds	Yes	2	1
	No	147	73.5
	N/A- Not affected by floods	51	25.5

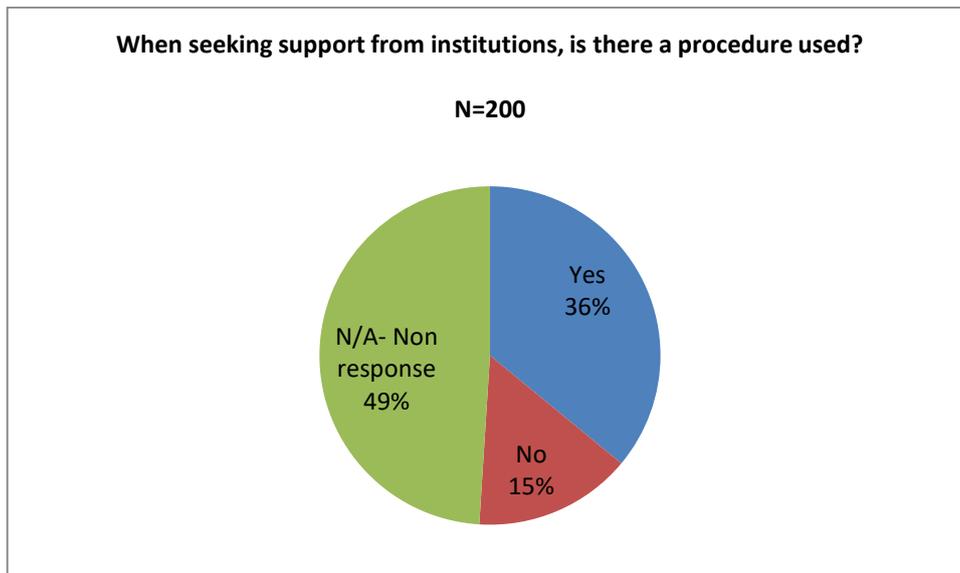
Further, 37 respondents (18.5 percent) reported that they were relocated to drier lands and provided with supplies, whereas support of advice on coping measures and cultivating on higher grounds accounted for 1 percent of the respondents each, respectively.

In the Simalaha area, relocation to drier lands was another significant part of adaptation for some communities in low lying area of Kazungula; mainly Mulombwe (Kasaya area), Ngwezi and parts of Mwandu (Interviews, 1:4; 2:1). The named locations experienced severe floods in 2006 and in 2008 prompting the government to allocate these communities to a permanent land in Namapande as a resettlement area (Interviews, 1:4; 2:1). The idea behind relocation was not only to lessen flood impacts felt of loss of property, homesteads and housing infrastructure on the part of the communities, but also to limit government support that went into evacuating people each time floods occurred (Interview, 2:1).

7.8 Procedures of Soliciting for Support from Meso-level Institutions

When asked whether or not there was a procedure used to solicit for support for adaptation to floods or droughts, the results show that 36 percent of the respondents stated that there was a procedure used to solicit for support, whereas a 15 percent of the respondents reported that there was no existing procedure used to solicit for support from meso-level institutions (Figure 7-12).

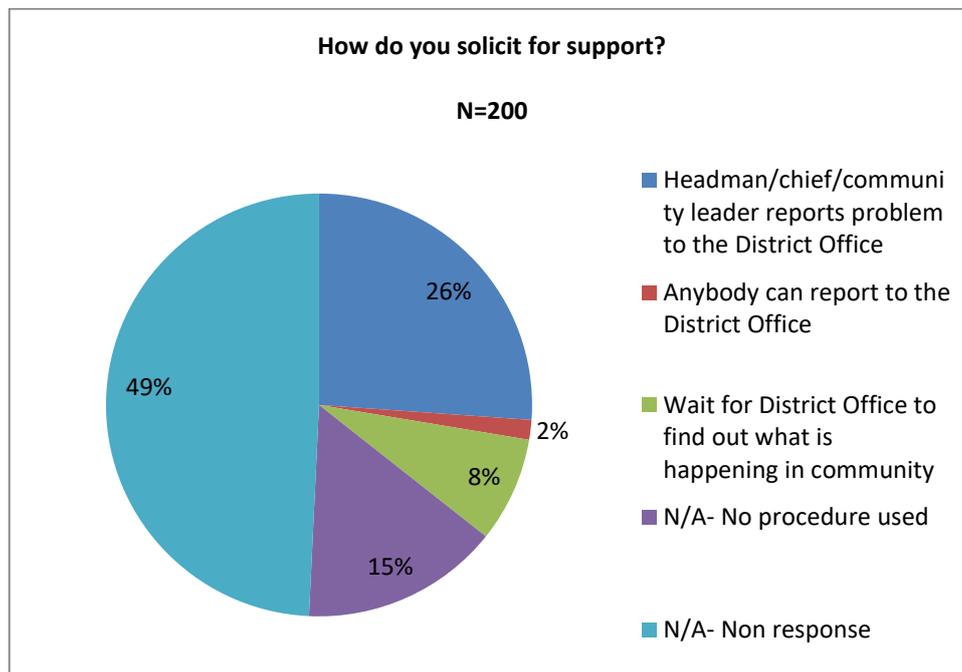
Figure 7-12: Is there procedure used to seek for support from meso-level institutions?



Of the respondents that reported that a procedure was used to seek for assistance from meso-level institutions for adaptation to floods or droughts, 26 percent stated that the

headman was in charge of soliciting for support whereas 8 percent reported that people in the communities just waited for meso-level institutions to discover what was happening in their communities to receive the support. Only 2 percent of the respondents stated that anybody could report problematic situations of floods and/or droughts to meso-level institutions to get assistance for adaptation to foods or droughts (Figure 7-13).

Figure 7-13: Procedure used to solicit for support



7.9 Conclusion

This study has shown that everyone has been impacted by droughts and floods regardless of demographic characteristics. With regards access to meso-level support, the study has shown that all people in different demographic categories have received more or less similar support for adaptation to floods and/or droughts. Nonetheless, with regards wealth categories “non-poor”, “middle poor” and “poorest”, the poorest still have less means to cope with the impacts of floods or droughts because they lack personal assets to rely on, and so hit the hardest, yet everyone gets equal amounts of support from meso-level institutions.

CHAPTER 8

COMMUNITY RESPONSES TO CLIMATE CHANGE SUPPORT

8. Introduction

This Chapter answers the fourth research question which is, “How do communities respond to the adaptation interventions provided by meso-level institutions?” To answer this question, household surveys and focus group discussions were used to assess how communities perceived the climate change adaptation interventions supported by meso-level institutions.

8.1 Perceived Relevance, Appropriateness, Adequacy or Timeliness of Support Received for Adaptation to Droughts

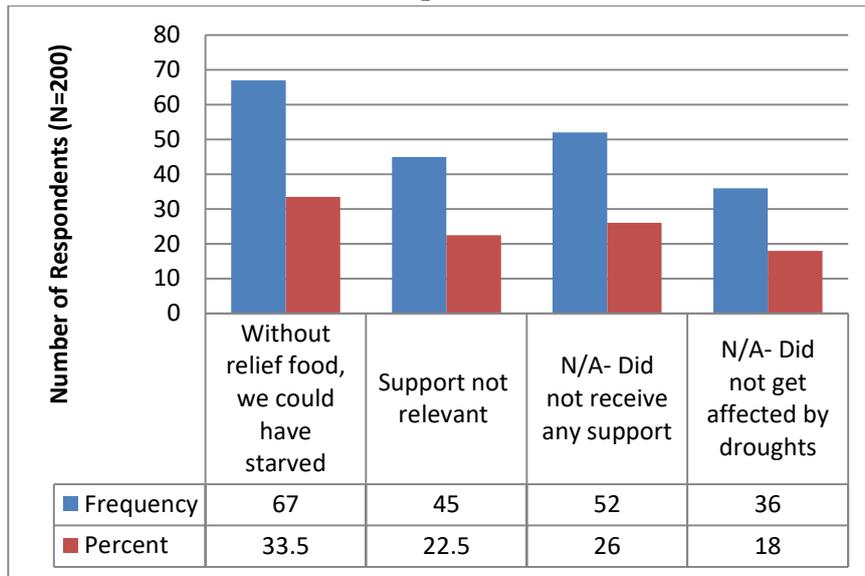
Support received for adaptation to droughts include food packages, advice on conservation agriculture, crops and fertilizer inputs, support to livestock restocking programmes and support to alternative forms of livelihoods (see Chapter 7). In this section, the research investigated whether or not respondents perceived interventions supported for adaptation to droughts to be relevant, adequate, timely, and appropriate in meeting targeted beneficiaries at their points of need. Therefore, details of how communities perceived institutional support, interventions and projects for improving local adaptation to droughts in the study area are discussed below.

8.1.1 Perceived Relevance of Food Packages received for Adaptation to Droughts

When people got affected by droughts between the period of 2000 and 2014, results of the household survey showed 67 respondents (33.5 percent) reported that support of food packages were relevant for their adaptation, emphasising that without food relief, they could have starved (Figure 8-1). In part, this high appreciation of support rendered is owed to the apprehension of extreme food insecurities that followed drought years. The early 2000s were among the most difficult years for people in the Simalaha and the Southern region of Zambia because dry spells were more pronounced and rainfall

received in these periods was generally much lower, than required amounts for crop production (Jain, 2007). The Simalaha areas being dominated by farmers that depend on rain-fed farming and other natural resources as major sources of income were also badly affected (Interviews, 1:1; 1:2).

Figure 8-1 Relevance of food packages as an adaptation intervention for droughts adaptation



Similar views were expressed by respondents during the focus group discussions held in Mwandu Community to show how the support of food packages offered immediate relief for communities affected by crop losses as a result of droughts:

“...The food support was relevant because it addressed hunger problems faced by people when crops failed as a result of droughts”. – (Focus group discussion, 1:1)

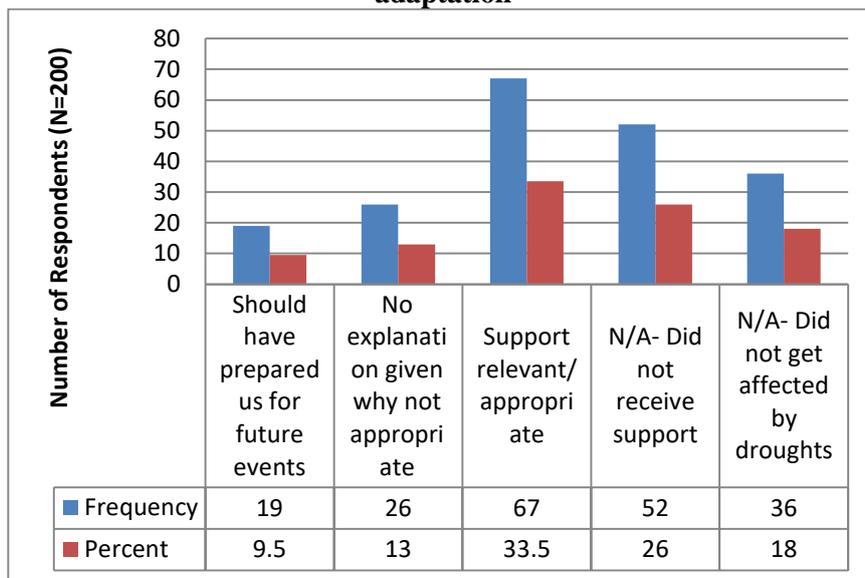
Figure 8-1 above also show that 45 respondents (22.5 percent) did not think support of food packages was relevant for adaptation to droughts.

8.1.2 Perceived Appropriateness of Food Packages received for adaptation to Droughts

In Figure 8-1 above, some respondents reported that food support was not relevant for adaptation. Reasons provided as to why food packages were perceived not to be relevant for adaptation to droughts was that, food packages were perceived as a short-term intervention designed to offer immediate coping relief from hunger and not an adaptation long-term solution (Interview, 1:1).

Further, results show that food packages were not appropriate for adaptation because food hand-outs, did not really prepare people on how to cope with food shortages in future, as reported by 19 respondents (Figure 8-2).

Figure 8-2: Appropriateness of food packages as an adaptation intervention for droughts adaptation



In Figure 8-2, results also show that 26 respondents (13 percent) did not give an explanation why they felt the support of food packages was not appropriate as a coping intervention to droughts.

8.1.3 Perceived Adequacy of Food Packages received for Adaptation to Droughts

In Kawana community, respondents interviewed through a focus group discussion reported that food support was adequate because all people affected by droughts in 2004 and 2005 were supported with sufficient amounts of food.

“...Provision of food staffs was excellently done and all people did not experience hunger despite not harvesting anything as a result of droughts”.

– (Focus group discussion 1:2)

However in Mwandi community, some respondents interviewed through focus group discussions, reported that support of food packages did not create any impact as a coping intervention following droughts experienced in 2005 because the support was inadequate to support all households and individuals affected.

“...most people did not benefit from the food support...people entrusted with redistributing foodstuffs kept most of it for themselves, and were selective in the way they redistributed the food. Only close friends and relations benefited from the food packages”.

– (Focus group discussion, 1:1)

This shows that, while efforts were made by meso-level institutions to support communities affected by droughts with required amounts of foodstuffs, the support was not adequate because some of it ended up being allocated to the unintended beneficiaries. This means that target beneficiaries lacked adequate food that should have been allocated to them.

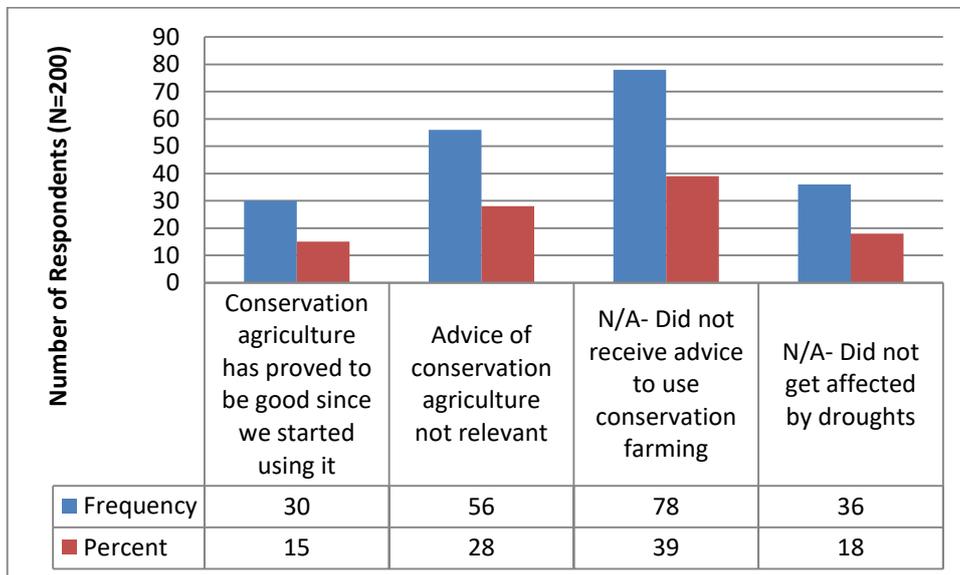
8.1.4 Perceived Relevance of the Advice to using Conservation Farming for Adaptation to Droughts

Of the respondents that received advice to using conservation farming for adaptation to droughts, 30 respondents (15 percent) reported that conservation agriculture had proved to be effective since farmers started using it after getting the advice (Figure 8-3) below.

Similar opinions were expressed during the focus group discussion by Kawana Community, in support of the advice and the use of conservation farming in the Simalaha area.

“...Benefits have been seen from the use of conservation agriculture in that when used properly, the yield is very good”. – (Focus group discussion, 1:2)

Figure 8-3: Relevance of conservation agriculture as an adaptation intervention for droughts adaptation



However alternative views were given by other households in the Simalaha area to discredit the advice to use conservation farming for adaptation to droughts. Results show that 56 respondents (28 percent) stated that advice to use conservation farming was not relevant for adaptation to droughts (Figure 8-3).

“...Sometimes, when we are asked to use conservation farming, we do not use it because it is not easy to always dig holes when farming big fields because it is very tiresome and labour intensive. Moreover, certain types of weeds grow well in holes where food crops should thrive and therefore difficult to control”. – (Focus group discussions, 1:1)

While conservation farming potentially produces high crop yields (Kandji et al., 2006; Marongwe et al., 2011; Arslan et al., 2013), some community members in the Simalaha area perceive it to be excessively labourious and will not use it as a whole or in part:

“..Even when farmers are shown the benefits of conservation farming, you will still find that three quarters of the field is conversional farming then only one quarter is where conservation farming is practiced”. – (In-depth interview, 2:2)

Most often than not, sustainable yield increases are only realised in the long term (Swennenhuis, 2012), which means that so much effort is made before one can realise the benefits from this kind of farming technology. In the Simalaha area, failure by farmers to see the ultimate benefits and the amount of effort put in exacerbates the low levels of appreciation for conservation agriculture as a technology for adaptation to droughts.

8.1.5 Perceived Timeliness of the Advice to using Conservation Farming for Adaptation to Droughts

Respondents from Namapande Community, interviewed through focus group discussions reported that advice on conservation farming was timely:

“...We were told [by Agricultural Extension Officer] to plant our maize using conservation farming during drought years... the advice given improved our yields not only for that year but for the following year as well. Their [Agricultural Extension Officer] advice is very important and it is something the community can depend on because they guide us on how to farm properly for improved crop yield”. – (Focus group discussion 1:4)

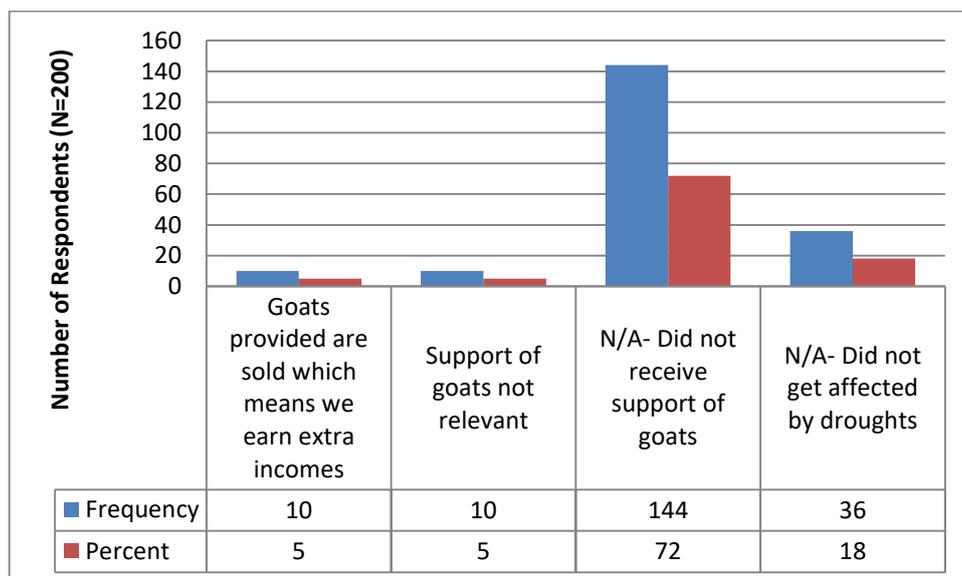
However, some respondents' felt the advice on the timeframe with which the planting basins were required to be prepared for conservation farming was not realistic. For instance, suggested basin preparation is July – September (Interview, 4:1) and people have until November or December for the rains to plant seeds. In the interim, windy

weather conditions and sometimes livestock stepping on the fields end up burying the basins before planting is done (Interviews, 1:1, 1:4). Consequently, farmers find themselves making repeated efforts to prepare other planting basins just before the actual planting is done.

8.1.6 Perceived Relevance/Significance of Livestock Received for Adaptation to Droughts

Since losses of livestock occurred in the Simalaha area as a result of foot and mouth disease and CBPP, there have been on-going programmes to restock livestock (see Chapter 6). Goats as opposed to cattle are being introduced by meso-level institutions as suitable livestock options because they are perceived to be resistant to diseases and are much more adaptable in dry conditions (Interviews, 2:2; 2:5; 2:11). In Chapter 7, it was revealed that 20 respondents (10 percent) reported that they received support of goats as a livestock restocking intervention in the Simalaha area. In this Chapter, we reveal that only half of the respondents accounting for 10 respondents (5 percent) stated that being supported with goats was relevant for adaptation to droughts (Figure 8-4).

Figure 8-4: Relevance of goats support as an adaptation intervention for droughts adaptation



One reason for appreciating goat support as an adaptation intervention is the benefit of income gains when sold in the long run.

“...restocking of livestock is relevant because though it does not address the hunger problem immediately, growing and selling the goats lessens a number of problems when in serious need of money”. – (Focus group discussions, 1:3)

8.1.7 Perceived Appropriateness of Livestock Received for Adaptation to Droughts

Although some respondents reported that the support of goats was relevant for their adaptation to droughts, about half of the respondents, accounting for 10 respondents (5 percent) reported that they did not perceive the support of goats as a livestock restocking programme to be relevant for their adaptation to droughts. While goats are been supported by meso-level institutions, their economic value is not comparable to that of cattle which is perceived as a symbol of wealth and status among many rural African communities (Barrett, 1999). Cattle keepers hold cattle as a store of wealth that could be converted into cash to meet specific needs (Barrett, 1999) at a later stage. Goats, on the other hand, accrue very little market value and are not perceived as symbols of wealth and status among livestock keepers and culturally. In the event of crop losses, goats are not appropriate for adaptation to droughts because the market value is low to support general livelihood.

Further, during the focus group discussion with Siankande Community, it was heard that the support of goats was not always accompanied by vaccines to prevent skin and other diseases that affect goats (Interview, 1:3). Goats that got infected could not easily be sold and that which could be sold had reduced market value. Figure 8-5 shows types of skins diseases affecting goats in the Simalaha area that could also be responsible for reduced market value for goats.



Figure 8-5: Goats affected by skin diseases

8.1.8 Perceived Appropriateness of Crop Inputs and Fertilizer Support for Adaptation to Droughts

Crop inputs supported in the Simalaha area are early maturing varieties of maize and drought tolerant crops such as cassava stems. Other support is in form of fertilizers. However, recipients of fertilizers expressed less appreciation of support received as evidenced by qualitative results of the focus group discussion conducted with respondents in Mwandia.

“...because, we are not in charge of soliciting for support, they [meso-level institutions] sometimes give us things that we do not need such as fertilizer inputs. We have been receiving, fertilizers every year to use in our fields, yet the soils do not need it, because it deteriorates the already poor soils. Therefore, such support is not appropriate for adaptation to droughts” – (Focus group discussion, 1:1)

This shows that interventions that are sometimes used and promoted do not align well with local adaptation practices and may be conflicting with local peoples' preferences. The farmer input support programme which has seen several organisations in addition to the government distributing fertiliser as a national policy has also been applied in Sesheke district of Western Province. Whilst fertilizer application shows good yield in the Southern Province and other areas *along the line of rail*, people of the Western

Province with soil orientations that are characterised with sandy formation see it as a waste to apply fertilizer because it gets washed away at the onset of the rains and also gets leached beyond crop roots after application (Interviews, 1:1, 3:18). Fertilizer has also been said to be the cause for further soil destruction to their already poor soils (Interview, 3:18). What is seen to be appropriate for soil development is using stock manure. But because there usually is no consideration of local contexts prior to implementation of such measures, the implementing government office and NGOs uses uniform strategies that are sometimes not beneficial to the intended users. As a consequence, recipients of the fertilizer support programme will upon receiving the fertilizer inputs, resale it to people who by far have correct use for the product (Interview, 1:1).

Further, crop yields are not seen to be improving despite the application of fertilizer in drought prone areas which further reduces appreciation of the support among respondents.

“...The main constraint of being supported with fertilizer is that it fails to address the problem of dry spells and still crop yields never improve even after using fertilizers because droughts still exist”. – (Focus group discussion, 1:1)

In some cases, crops supported by meso-level institutions such as sunflower are not appropriated because, while the yield may be good, there is no market available for such produce (Interview, 2:12). As a result, farmers continue to plant crops like maize despite bad results because when yields are good, market opportunities would be readily available (Interview, 2:12).

8.1.9 Perceived Timeliness of Crop Inputs and Fertilizer Support for Adaptation to Droughts

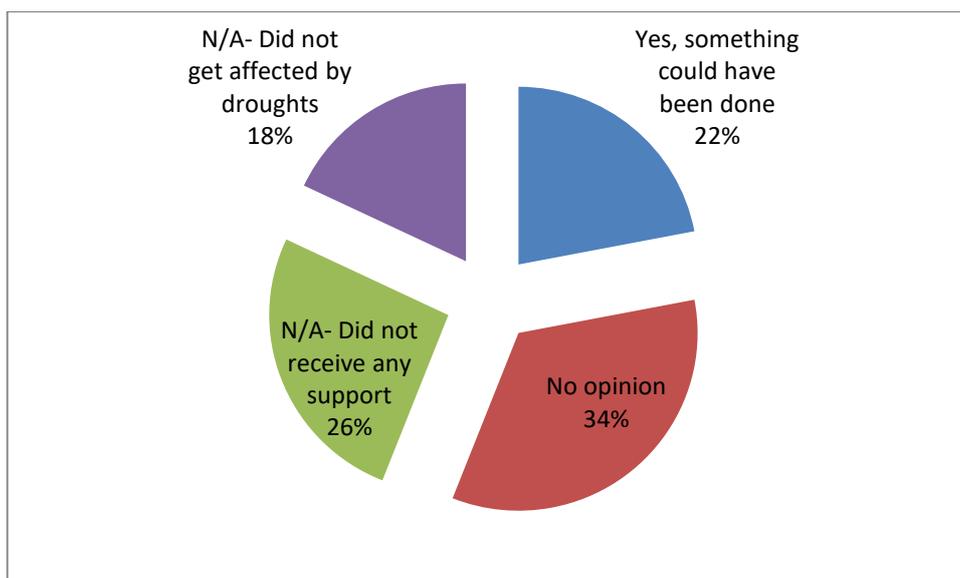
With regards support of fertilizer, new hybrid of crops or early maturing varieties of maize, the main criticism is that, the support is usually late when the farming season is way advanced making it irrelevant at the time it is made available (Interview, 2:4).

Planting the provided improved early maturing seeds, late in the crop farming season, would not yield the much needed benefits of improved crop outputs if support is provided when the rainy season is almost coming to an end. As a result, communities have tended to plant their local varieties of maize early in the season so that they do not lose out completely in case improved seeds failed to reach them before the farming season was over.

8.2 Interventions that could improve Relevance, Appropriateness, Adequacy or Timeliness of the Support for Adaptation to Droughts

For respondents that showed opinions of why the support they received was not relevant, appropriate, adequate or timely for their adaptation to droughts, research tools used to collect data asked a question “Is there anything you think could have been done better to improve meso-level institutional support received for adaptation to droughts?” The results show that 44 respondents (22 percent) stated that something could have been done to improve the support for droughts adaptations whereas 68 respondents (34 percent) expressed no opinion. Further, results also show that 26 and 18 percent of the respondents did not receive any support and did not get affected by droughts, respectively (Figure 8-6).

Figure 8-6: Is there anything that could have been done to improve support for adaptation to droughts?



Further, different opinions were expressed on what could have made the support received for adaptation to droughts more relevant, appropriate or adequate. With regards support of food packages and fertilizer, the focus group discussions held in Mwandia heard that food support would have been more effective if people in charge of distributing the support were honest to fairly distribute the food equally among all affected people (Interview, 1:1). With regards fertilizer support, the intervention could have been replaced with water sources such as dams, because water was the much needed resource that could support irrigation rather than fertilizer support.

“...Support could have been improved by assigning responsible and honest people to redistribute the food and livestock. Additionally, other than supporting people with fertilizer that they did not need, it could have been helpful to put up dams so that people could irrigate crops when rains failed and also use dams for gardening purposes”. – (Focus group discussion, 1:1)

Other opinions expressed on what could have made the support more relevant or adequate are outlined below:

- A survey could have been carried out to establish needs of the communities and provided with correct adaptation needs (Interview, 1:4);
- There should have been provision of chemicals to treat livestock instead of concentrating on maize provision alone (Interview, 1:3);
- Boreholes should have been drilled because drought had dried out most water sources (Interview, 1:2);
- Increased on the amount of food provided to ensure that each family member had enough to eat (Interviews, 1:1, 1:2);
- Should have prepared communities on how to respond to future drought occurrences instead of offering food (Interview, 1:1);
- In addition to the provision of goats, a vaccine should have been offered to keep goats healthy. Accessing vaccines in villages is a challenge because they can only be purchased in town which is far away (Interview, 1:3).
- Should have been advised what crops to grow in such weather conditions.

- Could have empowered people with business skills, alternative livelihood opportunities and capital for sustainability (Interview, 1:1).

With a list such as the one outlined, it shows that people are not just passive about the interventions that they are supported with for adaptation to droughts but also offer ideas of what could improve their adaptation to droughts.

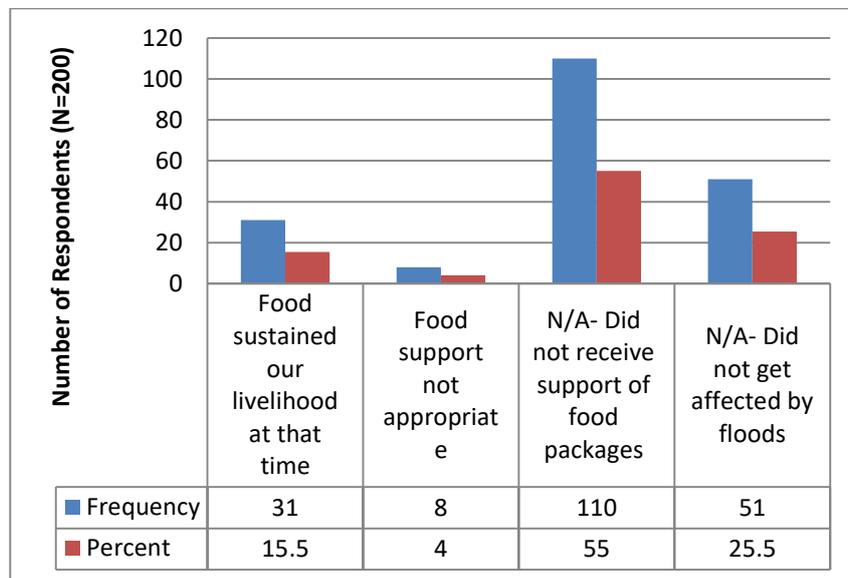
8.3 Perceived Relevance, Appropriateness, Adequacy or Timeliness of Support Received for Adaptation to Floods

Support received for adaptation to floods includes food packages and relocation to drier lands. In this section, the research investigated whether or not research participants perceived interventions supported for adaptation to floods to be relevant, adequate, timely, and appropriate in meeting beneficiaries at their points of need. Therefore, details of how communities perceived institutional support, interventions and projects for improving local adaptation to floods in the study area are discussed below.

8.3.1 Perceived Appropriateness of Food Packages Received for Adaptation to Floods

Similar to the case of adaptation to droughts, food packages were used as a coping intervention when crops were lost in the Simalaha area as a result of floods. Results show that 31 respondents (15.5 percent) reported that food packages were appropriate as a coping measure because it sustained their livelihoods at the time of need. On the other hand, only 8 respondents (4 percent) did not perceive food packages to be appropriate for their adaptation to floods. Further, 55 percent and 25.5 percent of the respondents did not receive any food packages for adaptation to floods and did not get affected by floods, respectively (Figure 8-7).

Figure 8-7: Appropriateness of food packages as an adaptation intervention for adaptation to floods



More than two-third of people affected by floods perceived the support of food packages to be relevant for their adaptation. Emphasising the significant role food packages played when crops and homesteads were lost during a flood, the focus group discussion conducted in Namapande Community reported that:

“...Despite all food lost in the floods, we could still have something to eat because the government came through for us”. – (Focus group discussion, 1:4)

Only a few households (4 percent) did not perceive support of food packages to be appropriate for adaptation after getting affected by floods. Mainly, this was because they perceived food support as a coping intervention rather than a long term adaptation intervention.

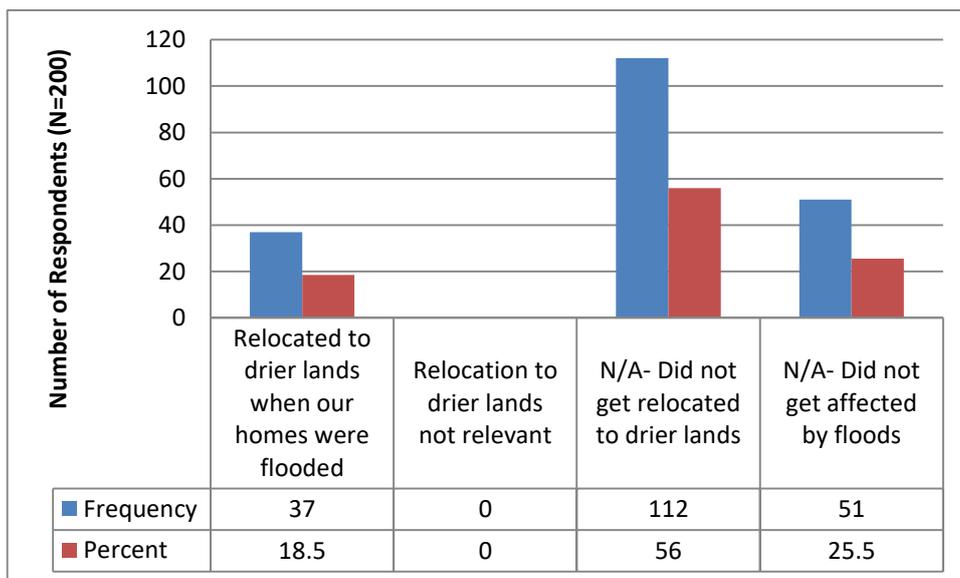
8.3.2 Perceived Relevance of Relocating Households to Drier Lands as Adaptation to Floods

With regards relocating people affected by floods, 37 respondents (18.5 percent) reported that they perceived being relocated to drier grounds to have been relevant for adapting to

floods. These accounts for all people interviewed that were supported during the Namapande resettlement programme. Results of the survey also show that no households perceived getting relocated to drier grounds to be irrelevant for adaptation. It is not surprising that all people surveyed reported that relocation support was relevant. While support to move to Namapande was open to everyone affected during floods, it was also not forced on individuals that did not want to move i.e. only people that were willing could be moved to Namapande. This implies that all people that relocated and still stayed on in Namapande would perceive the support to be relevant, because they perceived some benefits to this kind of support hence accepted to relocate.

Further, 56 and 25.5 percent of the respondents did not get relocated and did not get affected by floods, respectively (Figure 8-8).

Figure 8-8: Relevance of relocation adaptation in response to floods



As already alluded to in the previous sections, relocating flood victims of the 2006 and 2008 to Namapande settlement area was a big intervention that took place in 2008. Due to the gravity of damage caused to homesteads and crops, all people affected felt the relocation was a positive intervention as expressed by respondents through the focus group discussions conducted in Namapande Community.

“...If the government and NGOs had not come on board to help us when our homes got flooded, a lot of people would have been homeless. The support was therefore very relevant because we were given new hope after losing everything during the floods.” – (Focus group discussion, 1:4)

However, after a passage of time, promises made of being supported with early maturing varieties of maize, title deeds to the land, health centre and good road networks have not been fulfilled in the resettlement area of Namapande (Interviews 2:12, 2:13). This has caused frustration among people in the area. Moreover, in the recent past, a claim over land was made by a forest reserve organisation, for some of the land occupied by settlers, that it was part of a forest reserve and had to be vacated. Despite the claim not being successful, attempts to get displaced caused anxiety and uncertainty among inhabitants of the land especially that the absence of title deeds played a big role in their having no solid claim over the land (Interviews, 2:12; 2:13).

Further, households that relied on the rivers for fish have failed to adapt in Namapande where no open sources of water exist for fishing (Interviews, 2:4, 2:9, 4:1). Consequently, some have gone back to the flood prone areas to continue their livelihood of fishing where as other households have opted to maintain duo habitation system; one home in the flood prone areas of the Kasaya area to use in the dry season and the season for catching fish and the other one in Namapande to use in the wet season for farming purposes and to avoid getting flooded (Interviews, 2:4, 2:9, 4:1).

8.4 Intervention that could have been Relevant for Adaptation to Floods

A number of propositions were made during the focus group discussions in Mwandu and Namapande of what could have made adaptation to floods more effective.

“...In addition to being provided with sufficient food packages, communities, could have been provided with rice seeds so that they utilised the flood plains to grow rice, rather than reserving the plains for cattle grazing only. Partitions could have been made and shared between rice

growers and cattle owners so that equal opportunities of earning incomes could be realised between people with livestock and those without”. – (Focus group discussion, 1:1)

“...After relocating people to a new place, fulfilment of promises made could have followed through. For instance, promises were made that a new clinic would be built. Up until now, there is still no health centre for people who live in this area. In addition, the community school built only has one trained teacher to cater for all pupils at the school. This is far from being realistic. Trained teachers should be employed to improve on the standards of learning. There is also need to improve the road systems so that public transport can reach our community. To get to the main road, one has to walk more than 15 kilometres to get there”. – (Focus group discussion, 1:4)

Other opinions expressed on what could have made the support to floods more relevant are outlined below:

- Build health centre in the newly relocated area (Interview, 1:4);
- Could have been provided with good roads and a bridge to ease access to town (Interview, 1:3, 1:4);
- Could have been provided with skills and capital to start some other businesses (Interview, 1:1, 1:2, 1:4);
- Should have been advised on what crops to grow in the newly relocated place (Interview, 1:4);
- In addition to goats provided, vaccines could have been provided to cure the skin diseases off the goats (Interview, 1:3);
- Should have been provided with alternative livelihood opportunities to adapt to the new area (Interview, 1:4).

8.5 Conclusions

Chapter 6 showed Agrawal’s types of support rendered by meso-level institutions including information and training; technological advancement; finance investments and leadership. The research also drew on Agrawal’s (2008) analytical categories of adaptation responses (mobility, diversification, communal pooling and exchange) to

discuss meso-level institutional interventions that supported different types of adaptation strategies in theory. In this section, the research will further discuss whether or not there is a connection between adaptation support and people's adaptation strategies in practice. Further, the research will show whether or not farmers and inhabitants of the Simalaha area actually feel that they have been supported in reality (Table 8-1).

Table 8-1: Types of institutional support disaggregated into adaptation outcomes and people’s responses

Types of meso-level support	Specific type of support	Household adaptation strategies	How adaptation strategies support livelihood strategies	People’s responses in relation to adaptation strategy in reality	Overall household perception of the adaptation support
Information and training	Information on shifting farming patterns from growing maize to adopt other drought tolerant crops such as cassava and millet	Diversification	<ul style="list-style-type: none"> - Potentially diversifies crop production e.g. instead of growing maize alone, farmers grow other crops such as sunflower, cassava and sorghum - In some cases diversification may lead to replacing one kind of crop e.g. maize with another crop such as cassava or sunflower 	<ul style="list-style-type: none"> - Households do not consider diversification suitable for maize that is sold. They only apply it to crops meant for domestic consumption (e.g. sorghum, cassava) - Crop diversification is mainly applied to crops grown at a low scale 	<ul style="list-style-type: none"> - There are mixed feelings or perceptions to the support because the support is usually late when the rainy season is underway
		Exchange	<ul style="list-style-type: none"> - Potentially supports exchange strategy, by providing for new crops than can be marketed 	<ul style="list-style-type: none"> - Small portions of land are used to grow crops such as sunflower because they have shown to produce good yields in drought prone areas. Nonetheless, bigger portions of land are still allocated to traditional crops like maize 	<ul style="list-style-type: none"> - Mixed feelings or perceptions because some crops supported such as sunflower have no ready market. Consequently farmers continue to grow maize with the hope that yields would improve
	Information on shifting cultivation methods from conversional farming method to conservation agricultural method	Diversification	<ul style="list-style-type: none"> - Potentially diversifies crop production methods to improve on nutrient and moisture retention in drought prone areas 	<ul style="list-style-type: none"> - Fewer people respond positively towards conservation agriculture - In some cases, only small portions are cultivated using conservation farming whereas the bigger pieces of land are cultivated using conversional methods 	<ul style="list-style-type: none"> - Support is perceived with mixed feelings because it is labour intensive

Technological advancement/ Finance Investment	Introduction of goats	Diversification and Exchange	<ul style="list-style-type: none"> - Introducing a new type of livestock production e.g. from cattle production to goat production as a drought and disease tolerant option - Indirectly constrains mobility by replacing cattle (mobile production system) with goats. 	- Some households appreciate the support for long term use where as others would appreciate the support more if cattle was supported in the place of goats	- Perceived with mixed feelings because the support of goats does not address the immediate challenge of food insecurities. They are however appreciated because they grow fairly quickly and can be marketed within a shortest possible time to earn incomes
	Growing fodder for livestock	Diversification, Exchange, Communal pooling and storage	<ul style="list-style-type: none"> - Supports new forms of animal feed for local livestock that can be grown communally and marketed to earn incomes. - Fodder also serves to control grazing 	- The support has failed to continue because livestock keepers are not interested in the fodder produced	- Perceived to be mainly bad because goats and cattle prefer to consume fresh grass from river banks and in fields and avoid eating fodder
	Water infrastructural projects	Communal pooling; Storage	<ul style="list-style-type: none"> - Supports availability of water in drought prone areas through borehole drilling and mechanisation - Small dams provide for water harvesting opportunities used for livestock watering and gardening 	- Households consider the support of water infrastructure project as a welcome intervention	- Perceived to be mainly good because it improves water access for stock watering especially in the dry seasons
	Treadle pumps	Diversification, Exchange, Communal pooling and storage	- New technology supported to improve crop production through irrigation	- Only people with land along water bodies have the abilities to irrigate crops with treadle pumps	- Perceived with mixed feelings because the use of treadle pumps requires that one practices crop production close to sources of water e.g. rivers

Finance Investment	<p>Support of food, shelter and water in camps for people affected by floods</p> <p>Support of food for people affected by droughts</p>	None	<ul style="list-style-type: none"> - Short-term emergency assistance. Provides basic survival in extreme situations, but does not support long-term adaptation strategies. 	<ul style="list-style-type: none"> - Relief support seen to be vital for survival by people affected by floods or droughts. 	<ul style="list-style-type: none"> - Perceived with mixed feelings. Some appreciate the support because it offers immediate relief to hunger. On the other hand, others feel it does nothing to prepare people for future adaptation to droughts or floods
Leadership	Relocating people from flood prone areas to drier lands	Mobility	<ul style="list-style-type: none"> - Supports movement of communities to drier lands away from flood prone areas. - In a way, also potentially constrains mobility by placing people in a favourable environment for crop farming purposes. 	<ul style="list-style-type: none"> - Household voluntarily move to the new resettlement area with a hope of renewed farming opportunities and avoiding getting submerged in floods in the event that floods re-occurred 	<ul style="list-style-type: none"> - Perceived to be mainly good because it offers people with new opportunities to have homes for people that lose property due to floods. However, it does not take into account livelihood opportunities for people that are settled in the new area.

Meso level institutions support farmers with information on technological advancement through changing hybrids of crops and diversifying farming patterns from growing crops which cannot thrive in drought prone areas such as maize, to adopt other drought tolerant crops such as cassava and millet. These types of interventions support diversification as a type of household adaptation strategy. However, this research has shown that diversification of certain types of crops grown is hardly done at a large scale. One reason for this is because drought tolerant crops such as cassava and sunflower have low market value, compared to maize crop which has been one of the major cash crops for Zambia (CSO, 2004). With the majority of people in the Simalaha area depending on agriculture as an exchange type of household intervention, this poses a problem, because there are no foreseen economic benefits on the crops provided as alternative crop options suitable for the area.

Diversifying methods of farming from conventional farming to using conservation farming is equally practiced at a low scale. Knowledge of its benefits is sufficient among farmers, yet levels of practice are low mainly due to the intensity of labour input required. Moreover, the majority of farmers in the Simalaha area would have to rely on hand hoes, as the most affordable technology used, for cultivation which takes a much longer period to cultivate land which would only take a limited amount of time and effort to cultivate if rippers and ploughs were used.

Diversification of goat production, on the other hand, is perceived to hold benefits for local adaptation. While benefits may not be realised immediately, farmers realise benefits in the long run because goats grow fairly quickly, multiply much quicker than cattle, and may be sold within a shortest possible time to earn incomes. The latter view supports exchange type of household adaptation strategy.

Communal pooling and storage is supported through investments made in water infrastructure, by creating communal sources of water such as dams and boreholes for productive and domestic uses.

Leadership, a type of meso-level institutional intervention supported mobility when households were relocated to Namapande from flood prone areas of Kasaya and Sikaunze. However, the case of Namapande shows that leadership can be problematic if it is not followed up with other forms of investments that take into consideration people's livelihood opportunities. For example, inhabitants of Namapande were promised with investments in boreholes, a clinic, good roads and continued support by the government, yet most of these were not received. Shifting people from Sikaunzwe and Kasaya areas did not also take into consideration people's livelihood strategies of being reliant on the river for survival. This is why, currently, some households that practiced fishing as a livelihood strategy have continued to maintain dual habitation system; one in Namapande and the other in their original place of residence to sustain their fishing activities because Namapande lacks river resources for fishing activities.

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9. Introduction

The study investigated the climate change adaptation measures used by meso-level institutions in enhancing adaptation to climate change in the Simalaha area of Kazungula and Sesheke District of Zambia. Among the aspects covered included meso-level institutional support to local climate change adaptation; analysis of who gained access to meso-level institutional support, as well as how households perceived the interventions used for adaptation. Further, community local adaptation practices to climate change adaptation were investigated with an understanding that communities in the Simalaha area are also taking own initiatives to adapt to environmental changes and climate change. An overview of climate change in the study area was also given to provide insights of the kinds of climate change events that the adaptation efforts both at meso-institutional level and local level, were responding to.

9.1 Conclusions

9.1.1 Local Adaptation Practices Addressing Climate Change

Although meso-level institutions provide communities with various forms of support for adaptation to droughts and floods, communities are also taking own initiatives to adapt to the effects of climate change in the Simalaha area. When responding to challenges brought about by droughts, or unpredictable rainfall, the majority of the respondents engaged in day labour, while others opted to burn charcoal for a living. Other major activities people betrothed in included engaging in small businesses such as beer brewing and fishing, while others engaged in selling livestock, such as goats, chickens and cattle to survive. Despite efforts made to improve general livelihood when droughts or reduced amounts of rainfall were experienced, coping measures devised for survival were not without challenges. People that engage in day labour and small businesses complain of low earnings and/or incomes that were insufficient to sustain their livelihoods.

When people experience floods, households that are most vulnerable to losing their property tend to relocate to drier lands. However, others that perceive the occurrence of floods to be of low magnitude or floods that may not disrupt their livelihood, may choose to stay on within their habitations, yet, may opt to stop cultivating crops such as maize and grow rice which tolerates lots of water. This shows that, the type of adaptation to floods devised is highly dependent on people's analysis of their vulnerabilities, risks and capacities.

When responding to food insecurities brought about by floods, similar interventions as those used when people got affected by droughts, were used. Some households affected by floods engaged in small businesses of selling food stuffs, groceries and fish, while others opted to stop growing crops and engaged in alternative livelihood activities such as bee keeping. Further, some goat keepers used powder from battery cells to treat livestock with skin diseases that came about as a result of too much water logging and flooding. However, like the case of droughts, interventions used for adaptation to floods had challenges. The most reported challenge was lack of alternative activities when crops failed as a result of floods. Other major challenges cited included lack of government support – especially for people that did not receive any meso-level institutional support despite experiencing floods.

While various interventions are engaged in at household level to respond to droughts, floods or reduced amounts of rainfall, there are some activities that respond to similar challenges at community level. More than half of the interviewed households reported that they participated in community based organisations to respond to the problem of floods or droughts. Further, there were no codified rules, nor restrictions on who could participate in the groups because every willing member of the community was free to become a member of the community based organisations. However, other formalities that guaranteed one's participation, such as membership fees, constrained some households especially the poor from joining or fully participating in the groups.

Meetings to deliberate how to respond to problems of floods or droughts were the major activities undertaken in the community based organisations. Other activities included

capacity building on improved farming methods and dialogue with meso-level institutions on matters affecting communities. Other activities undertaken in the community organisations were highlighted. In Mwandu Central, community members responded to prevalent droughts by raising funds for poultry farming whereas in Kawana community, a group called Lima Club pooled funds from members to invest in income generating activities such as crafts making. In Namapande and Siankande, communities reported that they formed farming clubs to grow vegetables and raise livestock such as cattle, goats and chickens, for sell to raise income used to support members affected by droughts. However, while different clubs have been formed, some of them were not working effectively because members failed to fulfil their personal tasks given to them in the groups, while others reported that groups had failed to create awareness and build capacity about improved farming methods. However not all groups were a failure, as some groups were reported to be working well, especially building capacity in good farming techniques. Equally, in one community – Siankande, the group was working effectively because there was cooperation among members of the farming club that grew vegetables.

9.1.2 Meso-level Support to Climate Change Adaptation

Meso-level institutions in the Simalaha area are organised according to three main categories. These include public, civil society and NGOs. Public institutions comprise of local governments (organizations accountable to a local constituency through elections or some other mechanisms) and local agencies (agencies or arms of higher levels of government operating at local levels). Civil society organisations, on the other hand include organisations that are structured as membership organisations motivated by the need to advance common interests for its members. These include community groups, cooperatives, cultural groups, trade unions, churches, to mention but a few. NGOs and Cooperating Partners are premised on delivery of services to people in need, and organised on policy advocacy, and public campaigns in pursuit of social transformation.

Although the functionality and structure of the meso-level institutions supporting communities in the Simalaha differ, they all support adaptation to climate change. However, their emphases on the type of interventions supported are also different. Public

institutions have strong emphasis on information and training support. For example, the agricultural department used information and training to improve knowledge among farmers about the importance of adopting conservation farming techniques as a means of improving crop output in drought prone areas. Farmers were also trained in crop diversification, and producing drought tolerant crops such as cassava, millet and sorghum and other early maturing varieties of maize, in order to improve crop output with less amounts of rainfall. Equally, some other public institutions like the Meteorological and Forestry departments used information to try and change people's practices in agriculture and natural resources use in the Simalaha area, respectively.

Public institutions also support communities in the Simalaha area with technological advancements, though the support is mainly targeted at soft adaptation interventions such as advice and training on the use of conservation farming. This is not because they lack technical expertise required to implement hard adaptation projects. It is mainly because they are inadequately funded with required resources to implement climate change projects within their local budgets. Soft adaptation projects on the other hand are fairly cheap to implement and do not attract huge budgetary allocations.

Like public institutions, NGOs and donors also support communities with information and training on various livelihood opportunities. This is particularly important because, to some extent knowledge has the potential to enhance adaptation to climate change by enabling people anticipate long-term risks and make appropriate adjustments to increase their adaptive capacities to perceived environmental conditions.

NGOs and donors also support communities with hard adaptation projects that attract considerable amounts of money, such as development of water infrastructure and procuring livestock. For example, through the Pilot Programme for Climate Resilience (PPCR) project, the Climate Resilience Adaptation Facilitator (CRAF) rehabilitated a dam in Simandwa community and put up two mechanised solar powered boreholes in Mobole and Ndemena communities to improve people's access to water. Similarly, Zambia Red Cross Society and Land O' Lakes procured goats for households in the Simalaha areas as a means of improving livelihood assets.

The main adaptation interventions used by meso-level institutions support for the five distinct adaptation strategies include, mobility, diversification, storage, communal pooling and exchange. Diversification alone is supported by three types of meso-level interventions. These include information and training, technological innovation and finance investments. For example, supporting farmers with information and advice about shifting farming patterns from growing maize to adopting other drought tolerant crops such as millet is a diversification type of household adaptation. Equally, financing new technologies of using suitable seed hybrids supports diversification as a household adaptation strategy. Exchange on the other hand is only supported by linking farmers to markets for their animal and crop produce.

Communal pooling and storage types of adaptation strategies are mainly supported in investments of water infrastructure projects – where communal water resources are developed for community use both for domestic and productive uses. Mobility on the other hand was only supported to relocate inhabitants affected by floods in the Simalaha area. Currently, mobility as an adaptation is hardly supported. This is because moving with livestock potentially limits the control of animal diseases, which is a major problem for animal husbandry in the Simalaha area.

Although meso-level institutions had devised different techniques to support adaptation to climate change in the Simalaha area, they also experienced challenges in implementing and reaching out to the intended targets. Firstly, district government line agencies lacked adequate funds and had limited control of how money was disbursed to finance plans and projects for community projects. Implementation of projects relied on funds from central government which was, in most cases, inadequate and sometimes not made available to pursue activities in the implementation plans. As a consequence, local experts at district level failed to implement planned climate change adaptation activities, and also efforts made to improve local livelihoods ended up getting frustrated. In some cases, funded projects by central government did not address issues affecting communities on the ground. Further, local experts, such as agricultural and forestry personnel, lacked reliable transport required to reach communities in faraway communities and those located in areas with rough terrains. For instance, the Forestry department had no vehicle of their

own to monitor human interferences on the forestry, while the agricultural department extension personnel relied on motor bikes that were not supported with fuel. However, through own efforts and support from donors and other NGOs, local experts were able to find means of travelling long distances to support community adaptation to climate change in the Simalaha area.

The other issue that challenged effective support to climate change adaptation in the Simalaha area was poor coordination and collaboration among meso-level institutions. For example, in supporting crop diversification, more than four organizations supported communities with information on types of crops to grow for improved crop output. This situation was problematic in its own right because efforts on similar activities were duplicated. In some cases, information provided on how implementation was to be done was conflicting and caused confusion among recipients.

9.1.3 Recipients of Support for Climate Change Adaptation

More than one third and about a third of the respondents experienced droughts and floods in the Simalaha area, respectively. For both floods and droughts, the study found that experienced effects were equally distributed among males and females. However, variations were observed with regards age groups and period of residence in the Simalaha area. Older respondents and those that had lived in the Simalaha area for more than 2 to 4 decades reported to have experienced impacts of floods and droughts much more than the younger generation and residents that were fairly new to the area. This shows that there was a direct correlation between period of residence and/or age with the experience of droughts or floods. The older the respondent or the longer the period of residence for the respondent, the higher the chances that they would experience impacts of floods or droughts, in the Simalaha area.

Effects of floods and droughts were equally distributed among the non-poor, middle-poor and the poorest categories of people in the Simalaha area. However, due to differences in socio-economic conditions between the better-off households and the poor households, response strategies used were different.

With regards to receiving support for adaptation to floods, only less than one third of the surveyed respondents received support, even though $\frac{3}{4}$ experienced floods or its effects. This is because, extreme floods, which occurred in flood prone areas in 2006 and 2008, with disastrous abrupt effects took precedence in getting media attention and government support than did other flood events with small magnitudes and much more subtle.

With regards to actual recipients of support for adaptation to droughts, overall, males as opposed to females received the most support, suggesting that, while support is meant for everyone, it was mostly skewed towards males in the Simalaha area. However, marginal differences were observed among proportions of males and females to access support for meso-level institutions for adaptation to floods – showing that support for adaptation to floods was almost equally distributed.

The age group between 46 and 60, as opposed to younger age groups, received the most support for adaptation droughts. They were in the majority to be interviewed and they also reported to have been among the most affected by droughts. With regards to support for adaptation to floods, the most supported were in the age groups of 26 and 45 years old.

Further, the support was also equally distributed among the non-poor, middle-poor and the poorest categories of people in the Simalaha area for adaptation to both floods and droughts, though with a slight advantage towards the poorest. This suggests that everyone that was affected by droughts and floods in the Simalaha area was principally given equal amounts of support for adaptation. However, because poor people are not equally equipped to cope with and adapt to droughts or floods, this means that, relatively speaking, the poorest get less than the better off. Moreover, despite better-off members of the communities, elites and their relations being allocated support the same way as the poorest, they have at times gained more access to support meant for the poor through unconventional fraudulence methods. This is achieved by diverting some of the support allocated to the entire community, for own gains, thereby limiting access for the most poor within the communities.

Some of the support received for adaptation to floods and droughts included support of climate tolerant crops and fertilizer inputs, support to livestock restocking programmes, support of food packages, and advice on conservation farming, support to alternative forms of livelihoods and resettlement support. However, the most supported measure when crops failed as a result of droughts or floods was the support to food packages. Food packages are used as a relief measure for people affected by climate events in a given year. In essence this is simply a humanitarian type of intervention that offers immediate relief and not a long term adaptation strategy. Nonetheless, and to a lesser extent, other interventions such as advice on conservation farming, changes in types of grown crop and livestock restocking, are equally supported to improve adaptive capacities in agriculture and animal production, respectively. People may not have potential to instantaneously raise large sums of money from raising goats, for instance, but the availability of goats builds resilience and empowers them with sustainable options that in turn help to improve their development opportunities and diversify in livelihood options when primary sources of income are unavailable.

9.1.4 Community Responses to Climate Change Support

Food support was very much appreciated among people affected droughts in the Simalaha area. In part, this high appreciation of support rendered is owed to the apprehension of extreme food insecurities that followed drought years especially in the early 2000s when most of the Simalaha area was affected by hunger resulting from poor rainfall.

However, slightly less than a quarter complained that food support was not relevant for adaptation it was perceived as a short-term intervention designed to offer immediate relief from hunger. Food hand-outs did not really prepare people on how to cope with future food shortages or when direct support was withdrawn. Other households reported that support of food packages was adequate as a coping intervention because the support benefited only a few households within the communities, especially relations and friends to people entrusted with the distribution process.

For households that received advice to use conservation farming for adaptation to droughts, very few, about a sixth reported that the advice was relevant for adaptation. They noted that when conservation farming was applied properly, they perceived benefits through increased yield despite dry spells, as compared to households that did not use conservation farming. Yet still, others expressed different views that conservation farming was no relevant for their adaptation. This was mainly because its application was excessively labourious. Furthermore, the timeframe July – September with which planting basins were required to be prepared was said to unrealistic. Waiting until November or December to plant would mean that in the interim, windy weather conditions and sometimes livestock would end up burying the basins before planting was done. Consequently, farmers found themselves repeating their efforts to prepare other planting basins prior to the farming season.

Appreciation of the support of goats as a livestock restocking intervention was equally distributed among households in favour and those that had no appreciation of the support. While there was no direct link to goat production and droughts, the proceeds from goat sells when crops failed as a result of droughts could go a long way in reducing hunger and that increased appreciation among recipients in favour of goat support. Households that felt the support was not relevant for adaptation felt the economic value was too low to make any meaningful contribution to food insecurities. Furthermore, because the support of goats was not always accompanied by vaccines to prevent skin and other diseases, goats that got infected could not easily be sold and that which could be sold accrued a much more reduced market value.

With regards to support of fertilizer inputs, recipients in western province expressed less appreciation of support received because the soil type was not suitable for fertilizer application. What could have made the support more relevant was improving soil texture with manure as opposed to applying fertilizer which was perceived to deteriorate the soil further. In cases like this, lack of understanding for community adaptation preferences can limit how people interpret and respond to climate change adaptation. Depending on background settings, certain advocated for measures may be conflicting to contextual situations, beliefs and values and may therefore be irrelevant for communities which

support is intended. With regards to support of new hybrid of crops or early maturing varieties of maize, the main constraint was late delivery when the farming season was way advanced making it irrelevant at the time it was made available. Planting the provided improved early maturing seeds, late in the crop farming season, would not yield the much needed benefits of improved crop outputs if support was provided when the rainy season was almost coming to an end. In some cases, crops supported by meso-level institutions such as sunflower were not relevant because, while the yield would be good, there was no market available for such produce.

With regards to relocating people affected by floods, all households relocated found the support to be relevant for their adaptation. This is simply because only people with the willingness to move were relocated to Namapande. Those that had no willingness to move stayed on in the flooded areas and sought alternative methods of adaptation.

In both cases of floods and droughts, households reported of interventions that could have made the interventions more relevant for their adaptation. To reduce on hijacking of the food support rendered during droughts, the government could have entrusted the redistribution of food packages to trustworthy individuals. Other opinions expressed on what could have made the support more relevant were conducting a survey to establish needs of the communities before providing any support intervention to ensure that only correct community adaptation needs were met and also drill boreholes because most of the water sources had dried out due to reduced rainfall and drought conditions. With regards to adaptation to floods, it would have been more relevant if people were provided with sufficient food stocks and fulfilment of promises of roads, clinic and continued government support, made during the relocation of people to Namapande.

9.2 Recommendations

In view of the above conclusions, the following are recommendations:

- Meso-level institutions have the necessary expertise to implement climate change adaptation projects. There is need, therefore, to improve access and control of funds to carryout extension work and provide outreach activities to all individuals and groups affected by floods or droughts. For example field vehicles and corresponding

fuel funds should be made available at district level to ensure that local experts have ease of mobility to access all people in faraway places;

- Measures such as advice on crop diversifications and shifting crop types to suit the prevailing climate conditions should be up-scaled in areas most suited to the interventions and where communities are receptive. Funds to support communities with such interventions should be increased to enable officers communicate messages to communities that can improve food security and reduce the livelihood impacts of droughts and/or floods;
- Organisations working on similar projects such as livestock restocking, crop input support or conservation farming support should come together to collaborate their efforts to avoid duplication of effort and speak with one voice. This will increase the number of people supported and reduce confusions created when conflicting views are given by different organisations;
- In place of distributing food support or any other support equally among affected groups of well-being, consideration should be made that poorest groups receive the most support, than the better-off, because poor people are not equally equipped to cope with or adapt to floods or droughts. This will reduce inequalities among communities. Providing support equally only enriches the better-offs more, while the poor gets very little out of the support, which would consequently widen the social poverty gap;
- Intensify monitoring of climate change projects, particularly those targeting community support to ensure that the support serve the intended purpose. For example, elite capture and diverting of resources meant for the vulnerable in communities would be avoided if implementing officials effectively monitored how support was channelled to people affected by floods or droughts;
- There is need to give more attention to long term gradual climate change, not just disasters, because their effects on livelihoods are equally grave with long term excruciating impacts on everyday life;
- While it is important to support communities with coping interventions such as food support, interventions that improve livelihood opportunities in the long-term and build community capacity to adapt should be encouraged and supported more. That

way, community capacity will be built to cope with future eventualities of droughts or floods without relying heavily on the support of meso-level institutions;

- Realistic advice about field preparations when using conservation agriculture should be provided to people if the support is to be relevant. In the Simalaha area, farmers were asked to dig basins sometime between July and September in preparation for crop farming in December. This was found to be unrealistic because basins ended up getting buried by weather conditions prior the planting period thereby causing a repeat of pot-holing just before the planting is done;
- Although the support of goat production has the potential to improve livestock assets that farmers can rely on when crops fail due to floods or droughts, the support covers few people. It is, therefore, recommended that more funds are channelled to the purchase of goats for redistribution in the Simalaha area to improve on the number of people with livestock assets;
- It is also recommended that the support of livestock should be accompanied by relevant vaccines to improve on the quality of livestock and consequently increase the market value;
- Universal interventions such as countrywide support for fertilizer inputs should be avoided. It is recommended that research is used to inform implementers on what support is appropriate for specific areas. Simply put, support of climate change should be applied based on local contexts and should respond to specific local needs;
- It is recommended that the delivery of crop inputs, especially new hybrid crops suitable for drought prone areas, should be done early enough in the season prior to the crop farming season. This will enable farmers plan their farming activities properly and have opportunities to realise full benefits of the support;
- The support of crops such as sunflower guarantees good crop yield in drought prone areas. For sustainability however, in addition to being supported with inputs, farmers should also be linked to markets to ensure that they are able to sell the crop produce for maximum benefits.

REFERENCES

- Acquah, N.K., 2011. Community based adaptation: An empowering approach for climate resilient development and risk reduction. Adaptation Learning Programme, Care and climate change.
- Adams, M., 2003. Draft report on Land tenure policy and practice in Zambia: issues relating to the development of the agricultural sector, Mokoro Ltd 13 January 2003
- Adams, R.M., B.A. McCarl, and L.O. Mearns., 2003. The effects of spatial scale of climate scenarios on economic assessment: An example from the U.S. agriculture. *Climate Change*, 60, 131 – 148.
- Adeoti, A.; Barry, B.; Namara, R.; Kamara, A.; Titiati, A. 2007. Treadle pump irrigation and poverty in Ghana. Colombo, Sri Lanka: International Water Management Institute. 30p. (IWMI Research Report 117)
- Adger, W.N., S. Agrawala, M.M.Q. Mirza, C. Conde, K. O'Brien, J. Pulhin, R. Pulwarty, B. Smit and K. Takahashi., 2007. Assessment of adaptation practices, options, constraints and capacity. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 717-743.
- Adger, Neil. W., Irene. Lorenzoni and Karen. L. O'Brien,. 2009. *Adapting to climate change: Thresholds, Values, Governance*, eds. Cambridge University Press.
- Aggarwal, P.K., and P.K. Mall., 2002. Climate change and rice yields in diverse agro-environmentals of India. II. Effects of uncertainties in scenarios and crop models on impact assessment. *Climate Change*, 52, 331 – 343
- Agrawal, A., 2008. *The role of Local Institutions in Climate Change Adaptation*. Social Dimensions of Climate Change, The World Bank, Washington DC.
- Agrawal, A., C. McSweeney, N. Perrin., 2008. Local institutions and climate change adaptation. *Social Development Notes: Community Driven Development*. The Social Dimensions of Climate Change. No. 113 – July 2008

- Agrawal, A., and N. Perrin., 2008., Climate Adaptation, Local Institutions, and Rural Livelihoods. International Forestry Resources and Institutions Program (IFRI) Working Paper # W08I-6
- Agrawala, S. and Mark.A. Cane. 2002. "Sustainability: Lessons from Climate Variability and Climate Change", Columbia Journal of Environmental Law, Vol. 27 No. 2, pp. 309-321
- Ahmed, A. U., M. Alam, and A. A. Rahman., 1999. Adaptation to climate change in Bangladesh: future outlook. In: Vulnerability and Adaptation to Climate Change in Bangladesh [Huq, S., M. Asaduzzaman, Z. Karim, and F. Mahtab (eds.)]. J. Kluwer Academic Publishers, Dordrecht, The Netherlands. pp. 125-143.
- Alexandrov, V., J. Eitzinger, V. Cajic, and M. Oberforster., 2002. Potential impact of climate change on selected agricultural crops in north-eastern Australia. Glob. Change Biol., 8, 372 – 389.
- Araral, E., 2009. Reform of water institutions: Review of evidences and international experiences. Institute of Water Policy. Working Paper Series, Serial No IWP/WP/No. 1/2009
- Arslan, A., N. McCarthy., L. Lipper., S. Asfaw., A. Cattaneo., 2013. Adoption and Intensity of Adoption of Conservation Farming Practices in Zambia. Indaba Agricultural Policy Research Institute (IAPRI), Working Paper 71, February, 2013.
- Barret, J., (1999), The Economic role of Cattle in Communal farming Systems in Zimbabwe: Pastoral Development Network Paper, London: Overseas Development Institute.
- Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds., 2008. Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 210 pp.
- Bijlsma, L., C.E. Ehler, R.J.T. Klein, S.M. Kulshrestha, R.F. McLean, N. Mimura, R.J. Nicholls, L.A. Nurse, H. Perez Nieto, E.Z. Stakhiv, R.K. Turner, and R.A. Warrick, 1996. Coastal Regions and small islands. In: Climate Change 1995: Impacts, Adaptations, and Mitigation of Climate Change: Scientific-Technical Analyses. Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change. [Watson, R.T., M.C. Zinyowera, and

- R.H. Moss (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NK, USA, pp. 289-324
- Blaikie, P., 2006. Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Development*, 34, 1942-1957.
- Boko, M., Niang, A. Nyong., C. Vogel., A. Githeko., M. Medany., B. Osman-Elasha., R. Tabo and P. Yanda., 2007. Africa. Climate change 2007: Impacts, Adaptation and Vulnerability. Contribution of the Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M. L. Parry., O. F. Canziani., J. P. Palutikof., P. J. van der Linden., and C. E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433 – 467.
- British Council., 2010. Africa Talks Climate – The public understanding of climate change in ten countries. BBC World Service Trust, London
- Bruneau, S., 2013. Drought Adaptation and Management: Policy Advice. Battle River Watershed Alliance. September, 2013
- Bryan, E., and J. Behrman. 2013. Community-based adaptation to climate change: A theoretical framework, overview of key issues and discussion of gender differentiated priorities and participation CAPRI Working Paper No. 109. Washington, D.C.: International Food Policy Research Institute. <http://dx.doi.org/10.2499/CAPRIWP109>.
- Bryant, C.R., B. Smit, M. Brklacich, T.R. Johnston, J. Smithers, Q. Chiotti and B. Singh., 2000. Adaptation in Canadian agriculture to climate variability and change. *Climate change*, 36, 185-201
- Bryman, A., 2012. *Social Research Methods*, Oxford; Oxford University Press
- Burke. M., and D. Lobell., 2010. Food Security and Adaptation to Climate Change: What Do We Know? D. Lobell and M. Burke (eds.), *Climate Change and Food Security*, Advances in Global Change Research 37, DOI 10.1007/978-90-481-2953-9_8, Springer Science Business Media, B.V . 2010
- Butt, A.T., B.A. McCarl, J. Angerer, P.K. Dyke, and J.W. Stuth., 2005. The economic and food security implications of climate change. *Climate Change*, 68, 355 – 378

- Bwalya, S. M., 2010 Climate Change in Zambia: Opportunities for Adaptation and Mitigation through Africa Bio-Carbon Initiative. Center for International Forest Research Southern Africa January, 2010 Lusaka, Zambia
- CEDMHA (Center for Excellence in Disaster Management and Humanitarian Assistance). (2007). —Cyclone Sidr Update, <http://www.coe.dmha.org/Bangladesh/Sidr11152007.htm>
- Callaway, J., 2004. Adaptation benefits and Costs: Are they important in the global policy picture and how can we estimate them? *Global Environment Change*, this issue
- Campbell, J.L., 2010. Institutional Reproduction and Change. In: Morgan, G. (ed). *The Oxford Handbook of Comparative Institutional Analysis*. Oxford: Oxford University Press
- Canadell J.G., and H. A. Mooney., 2002. Biological and Ecological Dimensions of Global Environmental Change. *Encyclopedia of Global Environmental Change*, John Wiley & Sons, Ltd, Chichester
- CARE., 2013. Community Based Adaptation: An empowering approach for climate resilient development and risk reduction. *Adaptation Learning Programme*
- Carter, T.R., M.L Parry, H. Harasawa, S. Nishioka., 1994. IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations. University College, London, United Kingdom, and Centre for Global Environmental Research, Tsukuba, Japan, 59pp
- CFU. (2009). *Conservation Farming and Conservation Agriculture Hand Book for Hoe Farmers in Agro-Ecological Regions I & Iia-Flat Culture*. Lusaka: Conservation Farming Unit
- Chagutah, T., 2006. Recent floods in the Zambezi basin –a result of climate Change? In the Zambezi, p1,7; Vol. 6 no 3. SARDC.
- Challinor, A.J., T.R. Wheeler, P.Q. Cranfurd, C.A.T. Ferro, and D.B. Stephenson., 2007. Adaptation of crops to climate change through genotypic responses to mean and extreme temperatures. *Agric. Ecosys. Environ.*, 119, 190 – 204
- Chettri, N., Chaudhary, P., Tiwari, P.R., and R.B. Yadaw. 2012. Institutional and technological innovation: Understanding agricultural adaptation to climate change in Nepal. *Applied Geography* 33 (2012) 142 – 150

- Climate Change and Rural Institutions (CCRI) (2012). Climate Change and Rural Institutions Programme Description. Danish Institute for International Studies (DIIS). Copenhagen, Denmark
- Chongo, M., 2011. A geophysical study of the spatial distribution of saline groundwater in the Kalahari sand aquifer in the Sesheke area, Western Province, Zambia. 2011 Master Thesis, University of Zambia, Lusaka
- Christoplos I., Aben C., Bashaasha B., Dhungana H., Friis-Hansen E., Funder M., Nguyen Thi Thanh H., Khatri B. D., Lindegaard, L. S., Mweemba. C., Le Duc., N., Nyambe. I., Pain A., and Le Thi Hoa Sen., 2014. Towards “good enough” climate and disaster governance – Emerging lessons from Zambia, Nepal, Viet Nam and Uganda. DIIS Report 2014:21
- Cleaver, F. (2001) “Institutional Bricolage, Conflict and Co-operation in Usangu, Tanzania Institute of Development Studies Bulletin, 32 (4):26-35
- Cleaver, F., 2012. Development through Bricolage: Rethinking Institutions for Natural Resource Management. London: Routledge.
- Colaizzi, P.F., 1978. Psychology research as the phenomenologist views it. In Existential – phenomenological alternatives for psychology. (Eds. Valle RS and King M). Oxford University Press, New York
- Cooper, D.R., & Schindler, P.S., 2003. Business Research Methods. (8th ed.). Boston: 15 McGraw-Hill Irwin.
- Creswell, J. W., 2009. Research design: Qualitative, quantitative, and mixed methods approaches, 3rd ed. Thousand Oaks, CA: SAGE Publications.
- CSO (Central Statistics Office) (2004) Living Conditions Monitoring Survey. Zambia.
- CSO., 2010. Zambia 2010 Census of Population and Housing – Preliminary Report. CSO, Lusaka
- CSO., 2014. Zambia 2010 Census of Population and Housing. Lusaka Province Analytical Report. Central Statistical Office, March 2014
- Davis. K.E., 2010. Institutions and Economic Performance: An Introduction to the Literature. Forthcoming in Institutions and Economic Performance
- de Janvry, A., F. Finan, E. Sadoulet, and R. Vakis. (2006) "Can Conditional Cash Transfer Programs Serve as Safety Nets in Keeping Children at School and from

- Working When Exposed to Shocks?" *Journal of Development Economics* 79, No. 2 : 349-73.
- de Wit, M., 2006. Climate change and African agriculture. Policy note no. 27, August 2006, Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria, South Africa
- Department of Environmental Affairs. 2006. Botswana National Action Programme to Combat Desertification. Government of Botswana
- Dercon, S. and P. Krishnan. (2004) "Food Aid and Informal Insurance." In *Insurance against Poverty*, edited by S. Dercon. Oxford: Oxford University Press. Doorenbos
- Disaster Management and Mitigation Unit. 2005. National Disaster Management Policy. DMMU, Office of the Vice President, Lusaka, August 2005.
- Disaster Management and Mitigation Unit. 2008. 2008/09 Zambia National Contingency Plan for Floods. Lusaka, Zambia.
- Disaster Management and Mitigation Unit. 2010. The Disaster Management Act No 13 of 2010. Lusaka, Zambia.
- Easterling, W.E., N. Chhetri, and X. Nix., 2003. Improving the realism of modelling agronomic adaptation to climate change: Simulating technological substitution. *Climate Change*, 60, 149 – 173.
- Easterling, W.E., P.K. Aggarwal, P. Batima., K.M. Brander, L. Erda, S.M. Howden, A. Kirilenko, J. Morton, J.F. Soussana, J. Schmidhuber, F.N. Tubiello., 2007. Food, fibre and forest products. *Climate Change 2007: Impacts, Adaptation and Vulnerabilities. Contribution of the Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. [M.L. Parry., O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson, (eds.)]. Cambridge University Press, Cambridge, UK, 273 – 313.
- Ellis Frank., 1999. Rural livelihood diversity in developing countries: evidence and policy implications. *ODI Natural Resource Perspective*, Number 40, April 1999
- Erasmus, W., Mpoke, L., and Y. Yishak., 2012. Mitigating the impact of drought in Moyale District, Northern Kenya. *Humanitarian Exchange Magazine* ISSUE 53 March 2012. Concern Worldwide
- Evans, A., and Steven, D., 2009. An Institutional Architecture for Climate Change. A *concept paper*. Centre on International Cooperation, March 2009.

- Faguet, J.P., 2003. Decentralization and local government in Bolivia: an overview from the bottom up. Working Paper No. 29. Crisis States Programme Development Research Centre London School of Economics and Political Science LSE, London, United Kingdom.
- FAO. 1996. Agro-ecological zoning guidelines. FAO Soils Bulletin 73. Food and Agriculture of the United Nations, Rome, 1996.
- FAO. 2004. The role of local institutions in reducing vulnerability to recurrent natural disasters and in sustainable livelihood development – Consolidated report on case studies and Workshop findings and recommendations. Rural Institutions and Participation Service. FAO, Rome. April 2004.
- FAO-Adapt., 2013. Adaptation in action. FAO's work in climate change adaptation. Food and Agriculture Organisation of the United Nations. Rome, Italy
- FAO., 2012. "What is CA?" "Principles of CA." "Benefits of CA." Accessed on 12 December, 2012.
- Fayol, H., 1949. *General and Industrial Management*. (trans. C Storrs). London: Pitman.
- Frank, N. L., and S.A. Husain., 1971. The Deadliest Tropical Cyclone in History?|| Bulletin of American Meteorological Society, Vol. 52, No 6, 1971.
- Funder, M., Mweemba, C. E., and I. Nyambe. 2013. The climate change agenda in Zambia: National interests and the role of development cooperation. DIIS Working Paper 2013:13
- Goklany, I.M., 1995. Strategies to enhance adaptability: technological change, economic growth and free trade. *Clim Change* 30:427–449
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597-606. Retrieved [Insert date], from <http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf>
- Govaerts, B., Verhulst, N., Castellanos-Navarrete, A., Sayre, K. D., Dixon, J., & Dendooven, L. (2009). Conservation Agriculture and Soil Carbon Sequestration: Between Myth and Farmer Reality. *Critical Reviews in Plant Science*, 28, 97-122. <http://dx.doi.org/10.1080/07352680902776358>
- Government of Malawi. 2012. National Climate Change Policy. Ministry of Environment and Climate Change Management, Environmental Affairs Department.

- Government of the Republic of Zambia. 2011. Strategic Programme for Climate Resilience. Prepared for the Pilot Programme for Climate Resilience (PPCR).
- GRZ., 2011b. National Climate Change Response Strategy (NCCRS). p24
- Government of the Republic of Zambia., Undated. Kazungula District Strategic Plan (Draft). Kazungula, Zambia
- Grandin, B.E., 1988. Wealth Ranking in Smallholder Communities. IT Publication, London
- Gupter, J. and M. Hisschemoller., 1997. Issue linkage as a global strategy toward sustainable development: a comparative case study of climate change. *International Environmental Affairs*, 9(4), 289-308.
- Haddad, B. M., 2005. Ranking the adaptive capacity of nations to climate change when socio-political goals are explicit. *Global Environ. Chang.*, 15, 165 – 176
- Haddad, B. M., Sloan, L., Snyder, M., and J. Bell., 2003. Regional climate change impacts and freshwater systems: focusing the adaptation research agenda. *International Journal of Sustainable Development*, 6, 265 – 282
- Hallegatte S., Bangalore, M., Bonzanigo, L., Fay, M., Kane, T., Narloch, U., Rozenberg, J., Treguer, D., and A. Vogt-Schilb., 2016 *Shock Waves: Climate Change and Development Series Managing the Impacts of Climate Change on Poverty*. 2016 International Bank for Reconstruction and Development / The World Bank 1818 H Street NW, Washington, DC 20433
- Hegerl, G.C., F. W. Zwiers, P. Braconnot, N.P. Gillett, Y. Luo, J.A. Marengo Orsini, N. Nicholls, J.E. Penner and P.A. Stott, 2007: *Understanding and Attributing Climate Change*. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Hobbs, P. R., Sayre, K., & Gupta, R., 2008. The role of conservation agriculture in sustainable agriculture. *Philosophical transactions of the royal society*, 363, 543-555. <http://dx.doi.org/10.1098/rstb.2007.2169>
- Hodgson, G. M., 2006. What Are Institutions? *Journal of Economic Issues* Vol. XL No. 1 March 2006

- Hodson, G. M., 2006. What are institutions? *Journal of Economic Issues*. Vol. XL. No. 1. March 2006.
- Howden, M., and R.N. Jones., 2004. Risk assessment of climate change impacts on Australia's wheat industry. *New Directions for a Diverse Planet: Proceeding of the 4th International Crop Science Congress*, T. Fischer, N. Turner, J. Angus, J. McIntyre, L. Robertson, A. Borrell, and D. Lloyd., Brisbane, Australia.
- Howden, S.M., A.J. Ash, E.W.R. Barlow, C.S. Booth, R. Cechet, S. Crimp, R.M. Gifford, K. Hennessy and Coauthors., 2003. An overview of adaptive capacity of the Australian agricultural sector to climate change – options, costs and benefits. Report to the Australian Greenhouse Office, Canberra, Australia, 157 pp.
- ICIMOD., 2013. *Natural Resource Management Approaches and Technologies in Nepal: Technology – Treadle pump*, IDE–Nepal and ICIMOD
- Ifeanyi-obi C.C., Etuk U.R., and O. Jike-wai., 2012. Climate Change, Effects and Adaptation Strategies; Implication for Agricultural Extension System in Nigeria. *Greener Journal of Agricultural Sciences*, Vol. 2 (2), pp. 053-060, March 2012
- International Federation of Red Cross and Red Crescent Societies. 2010. *Zambezi River Basin Initiative*. Johannesburg, South Africa.
- IFRC., 2012. *Annual report Zambia*. MAAZM001, April, 2012
- IIED. 2013. *Ensuring devolution supports adaptation and climate resilient growth in Kenya*. IIED Briefing, June 2013
- IPCC., 2001. *Climate Change 2001: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. McCarthy, J. J., O.F. Canziani., N.A. Leary., D.J. Dokken., and K.S. White, Eds., Cambridge University Press, Cambridge, 1032 pp.
- IPCC, 2001. *Climate Change 2001: The Scientific Basis*. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Houghton, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 881pp.
- IPCC., 2011: *Summary for Policymakers*. In: *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen,

- S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- IPCC, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.
- IPCC, 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Irwin A., and B. Wynne, Eds., 1996. *Misunderstanding Science: The Public Reconstruction of Science and Technology*, Cambridge University Press, Cambridge, 240 pp.
- IUCN. 2009. Site specific evidence of climate change/variability in KapiriMposhi, Mwansabombwe and Sesheke. IUCN Climate Change and Development Project Background Studies. IUCN/FINNIDA.
- IWMI., 2009. Flexible Water Storage Options and Adaptation to Climate Change. Water Policy Brief Issue 31, 2009
- Jain, S., 2007. An Empirical Economic Assessment of Impacts of Climate Change on Agriculture in Zambia. Policy Research Working Paper 4291. World Bank.
- Japan International Cooperation Agency (JICA)/Ministry of Energy and Water Development (MEWD)., 1995. The study on the national water resources master plan in the Republic of Zambia. *Final report supporting Volume 2*. Yachiyo Engineering Co., Ltd.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A., 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.
- Kalantary, C., 2010. Climate change in Zambia: Impacts and adaptation. *Global Majority E-Journal*, Vol. 1, No. 2 (December, 2010), pp. 85-96

- Kandji, S. T., Verchot, L., and Mackensen, J., 2006. Climate change and variability in Southern Africa: Impacts and adaptation in the Agricultural Sector. Paper prepared for the World Agro-forestry Centre and the United Nations Environmental Programme.
- Kasali, G., 2008. Climate change and health in Zambia. CLACC Working Paper No. 2 , IIED London.
- Koelle, B., Bachofen, C., Suarez, P., Coughlan, E., Red Cross Red Crescent Climate Centre; Jones, R., Met Office Hadley Centre; Mudenda, W., and Zambia Red Cross Society., 2015. Using climate information to achieve long-term development objectives in Zambia. Policy Brief, January, 2015.
- Kruger, A.C., and S. Shongwe., 2004. Temperature trends in South Africa: 1960 – 2003. South Africa. *International Journal of Climatology*, 24, 1929 – 1945
- Lamboll, R., V. Nelson., and N. Nathaniels., 2011. Emerging approaches for responding to climate change in African agricultural advisory services: Challenges, opportunities and recommendations for an AFAAS climate change response strategy. AFAAS, Kampala, Uganda and FARA, Accra, Ghana.
- Land O’ Lakes., 2014. Building resiliency in Southern and Western Zambia through Community-based livestock production and marketing (2010-2013). Land O’ Lakes, International Development
- Leary, N.A., 1999. A framework for benefit-cost analysis of adaptation to climate change and climate variability. *Mitigation and adaptation strategies for Global Change*, 4(3-4), 307–318
- Lekprichakul, T., 2008. Impact of 2004/2005 Drought on Zambia’s Agricultural Production: Preliminary Results, Research Institute for Humanity and Nature, March 2008
- Lewis, D., and N. Kanji., 2009. Non-governmental organisations and development. Routledge Taylor and Francis Group, London and New York
- Lipper, L., W. Mann., A. Mayberk., R. Sessa. 2010. The Hague Conference on agriculture, food security and climate change: “Climate – Smart” Agriculture – policies, practices and financing for food security, adaptation and mitigation.

- Lobell, D.B., Burke, M.B., Tebaldi, C., Mastrandrea, M. D., Falcon, W. P., and R. L., Naylor (2008) Prioritizing climate change adaptation needs for food security in 2030. *Science* 319(5863):607–610
- Loster, 2008; Poor people are the real losers: Weather related catastrophes: Greater frequency and severity. Dossier Climate Change
- Lund, C., 2006. Twilight Institutions: Public Authority and Local Politics in Africa. *Development and Change* 37(4): 685–705 (2006). C Institute of Social Studies 2006. Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main St., Malden, MA 02148, USA
- Lwando. C., 2013. Climate Variability and Gender: Emerging Experiences from Western Zambia. Canadian Centre of Science and Education. *Environment and Natural Resources Research*; Vol. 3; No 4; 2013
- Maantay, J., Becker, S., 2012. The health impact of global climate change: A geographic perspective. *Applied Geography* 33 (2012) 1-3
- Macours, Karen., Premand, Patrick., and Renos Vakis., 2012. Transfers, Diversification and Household Risk Strategies: Experimental evidence with lessons for climate change adaptation. Paris School of Economics and INRA; The World Bank
- Madzwamuse, M., 2009. Adaptation: Rational or sticky point for climate change negotiations? In *On the road to Copenhagen*. Perspectives # 2.09. HBS
- Madzwamuse, M., 2010. Climate governance in Africa: Adaptation strategies and institutions [Heinrich Boll Stiftung (eds)]. Camco Advisory Services (K) Ltd, Oladipo. E., K. Omari., M. Madzwamuse., N. Hepworth and T. Chagutah.
- Mahoney, J. and K. Thelen., 2010. A Theory of Gradual Institutional Change' in J. Mahoney and K. Thelen (eds.), *Explaining Institutional Change: Ambiguity, Agency, and Power*, New York: Cambridge University Press, pp. 1–37.
- Makano R., 2011., Forests and Climate Change – Integrating Climate Change Issues into National Forest Programmes and Policy Frameworks. Background Paper for the National Workshop, Zambia. Tuskers Hotel, Kabwe. April 27-28, 2011
- Malhi. Y., and J. Write., 2004. Spatial patterns and recent trends in the climate of the tropical rainforest region. *Phil. Trans. R. Land.* B2004, 395

- Malik, A., X. Qin, S.C. Smith., 2010. Autonomous adaptation to climate change: A literature review. Washington D.C. IIEP Working Paper 2010-24, August 20, 2010.
- Mare, A., 2011. Climate Change, Mitigation and Mediatization in Southern Africa: Towards climate and environmental journalism. AfrikaAdapt Symposium, Addis Ababa, Ethiopia, 9 – 11 March 2011.
- Marongwe, L. S., Kwazira, K., Jenrich, M., Thierfelder C., Kassam A., and T. Friedrich., 2011. An African success: the case of conservation agriculture in Zimbabwe International Journal of Agricultural Sustainability 9(1) 2011
- McGregor, J., 1993. Refugees and the environment. In: Geography and Refugees: Patterns and Processes of Change [Black, R. and V. Robinson (eds.)]. Belhaven, Chichester, United Kingdom, pp. 220.
- Ministry of Finance., 2013. Investment projects for the Barotse and Kafue Sub-basins under The strategic Programme for Climate Resilience in Zambia, Final Draft Report, February 2013
- MTENR., 2007. Formulation of the National Adaptation Programme of Action on climate change. September, 2007
- Ministry of Finance. 2013. Environmental and Social Management Framework, Volume 1. Investments Projects for the Barotse and Kafue Sub-Basins – Under the Strategic Programme for Climate Resilience in Zambia. NIRAZ Zambia. February, 2013.
- Ministry of National Development Planning. 2016. National Policy on Climate Change. Ministry of Lands, Natural Resources and Environmental Protection, Lusaka, April 2016
- Ministry of Tourism, Environment and Natural Resources (METNR). (2007). Formulation of the National Adaptation Programme of Action on Climate Change. Lusaka. Zambia
- Morton, J. F., 2007. The impact of climate change on smallholder and subsistence agriculture. Natural Resources Institute, University of Greenwich, Kent ME4 4TB, United Kingdom. 19680 – 19685, PNAS. December 11, 2007, Vol. 104. No.50
- Mosse, D., 1997. The symbolic making of a common property resource: History, ecology and locality in a tank-irrigated landscape in South India. Development and Change 28(3): 467–504.

- Mustafa, D., 1998. Structural causes of vulnerability to flood hazards in Pakistan. *Economic Geography*, 74(3), 289-305.
- Mwape, Y. P., 2009. An impact of floods on the socio-economic livelihoods of people: A case study of Sikaunzwe community in Kazungula District of Zambia. Msc Dissertation, Disaster Risk Management Training and Education Center, University of the Free State, South Africa
- Mweemba, C. E., Nyambe, I., & Funder, M., 2015. Strengthening Climate Change Adaptation in Zambia. DIIS Policy Brief. Danish Institute for International Studies, Copenhagen.
- Neubert, S., K. Michael, A. Krumsiek, A. Schulte, N. Tatge, and L. Zeppenfeld., 2011. Agricultural development in a changing climate in Zambia. German Development Institute. Studies Paper No. 57.
- New, M., B. Hewitson, D.B. Stephenson, A. Tsiga, A. Manhique, B. Gomez, and C.A.S. Coelho., 2006. Evidence of trends in daily climate extremes over Southern and Western Africa. *J. Geophys. Res. – Atmos.*, 111, D14102
- North, D. C., 1990. Institutions, institutional change and economic performance. Cambridge University Press. New York.
- North, D., 1991. Institutions. *The Journal of Economic Perspectives*, 5 (1): 97-112
- Nyadawa, M., A.S. Kenya., P.M.A. Odira., B.O. Ndwallah., H.K. Soussa, O. Munyaneza., C. Ndayisaba., R. Bizimana., D.M.M. Mulunga., and H. Fadul., 2010. Integrated flood and drought management for sustainable development in the Nile Basin. Nile Basin Capacity Building Network Office
- Nyanga, P. H., 2012. Factors influencing adoption of and area under conservation agriculture: A mixed methods approach. Canadian Centre for Science and Education. Sustainable Agriculture Research; Vol 1: No. 2; 2012
- OCHA., 2013. Humanitarian Bulletin Southern Africa. Issue 11, June 2013
- OECD., 2009. Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance, OECD, 2009
- O'Donnell, L., 2011. 'Trees for Zambia' – Meeting climate change challenges through voluntarism, knowledge sharing and collaboration. Greenpop

- Olmos, S., 2001. Vulnerability and Adaptation to Climate Change: Concepts, Issues, Assessment Methods. Foundation Paper Prepared for the Climate Change Knowledge Network July 2001
- Ortbals, C. D., M. Rincker, and C. Montoya. 2011. Politics close to home: The impact of meso-level institutions on women in politics. *Journal of Federalism* Vol. 42; No. 1, pp. 7 –107.
- Ostrom, E., 1990. *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press
- Overseas Development Institute. 2012. Thailand Climate Public Expenditure and Institutional Review. Prepared for the Ministry of Finance, Ministry of Natural Resources and Environment, Office of the National Economic and Social Development Board and the Bureau of Budgets
- Palys, T. (2008). Purposive sampling. In L. M. Given (Ed.) *The Sage Encyclopedia of Qualitative Research Methods*. (Vol.2). Sage: Los Angeles, pp. 697-8.
- Pelling, M., 2011. International Dimensions of Climate Change Discussion Paper 5: Climate change and social capital, Department of Geography, King's College, London. URN: 11/1029
- Perrow, C., 1986. *Complex organizations: A critical essay*. New York: McGraw-Hill.
- Peters, I., I. Christoplos, M. Funder, E. Friis-Hansen, and A. Pain., 2012. Understanding institutional change: A review of selected literature for the Climate Change and Rural Institutions Programmes. Copenhagen, Denmark. DIIS Working Paper 2012: 12
- Pettengell, C., 2010. Climate Change Adaptation: Enabling people living in poverty to adapt. Oxfam Research Report, April, 2010
- Pittock, B., and R.N. Jones., 2000. Adaption to what and why? *Environmental Monitoring and Assessment*, 61(1), 9–35
- Prowse, M., and Scott, L., 2008. Assets and adaptation: An emerging debate. *Institute of Development Studies IDS Bulletin* Volume 39 Number 4, September 2008, p.p 42 – 52.
- Ragasa, C., Sun, Y., Bryan, E., Abate, C., Alemu, A., and M. N. Keita., 2013 *Organizational and Institutional Issues in Climate Change Adaptation and Risk Management – Insights from Practitioners' Survey in Bangladesh, Ethiopia, Kenya,*

- and Mali. International Food Policy Research Institute (IFPRI) Discussion Paper 01279
- Rayner, S., and E. L. Malone (eds). 1998. Human choice and climate change. Volume: The Tools for Policy Analysis. Battelle Press, Columbus, OH, USA, pp. 429.
- Republic of Mozambique. 1999. National Policy on Disaster Management. Reproduced on the occasion of the celebrations of the IDNDR (1999-2000) Maputo, October, 1999.
- Ribot, J., 2012. Adding Insult to Injury: Climate Change, Social Stratification, and the Inequities of Intervention. *Global Environmental Change*, Volume 22, Issue 22, May 2012, Pages 323–328
- Richards, M., 2003. Poverty Reduction, Equity and Climate Change: Global Governance Synergies or Contradictions? Overseas Development Institute, Globalisation and Poverty Programme
- Riché, B., 2007. Climate Change Vulnerability Assessment in Zambia. Climate change and Development Project, Pilot Phase, IUCN Forest Conservation Programme. March 24th to April 23rd, 2007
- Rodima-Taylor, D., M.F. Olwig, N. Chhetri., 2012. Adaptation as innovation, innovation as adaptation: An institutional approach to climate change. *Applied Geography* 33 (2012); 107 – 111.
- Saleth, R. M., and Dinar, A., 2004. The institutional economics of water: A cross-country analysis of institutions and performance. Edward Elgar and the World Bank, Northampton, MA.
- SARDC. 2010. Responding to climate change impacts: Adaptation and mitigation strategies as practices in the Zambezi River Basin. Southern African Research and Documentation Center/ Heinrich BöllStiftung
- Schipper, L., 2009. Meeting at the crossroads?: Exploring the linkages between climate change adaptation and disaster risk reduction. Climate and development Article review. Stockholm Environment Institute, Thailand
- Schipper, L., Liu, W., Krawanchid, D. and Chanthy, S. 2010. Review of climate change adaptation methods and tools. MRC Technical Paper No. 34, Mekong River Commission, Vietiane.

- Schouten, M. 2009. Strategy and performance of water supply and sanitation providers: effects of two decades of neo-liberalism. CRC Press/ Balkema. The Netherlands
- Selznick, P., 1996. Institutionalism “old” and “new”. *Administrative Science Quarterly*, 41, 270-277.
- Siegel, P. B., 2008. Profile of Zambia’s Smallholders: Where and Who are the Potential Beneficiaries of Agricultural Commercialization? Africa Region Working Paper Series No. 113 June 2008
- Sithole, P. (2011). A comparative study of rural water governance in the Limpopo Basin. PhD thesis. Institute for Poverty Land and Agrarian Studies (PLAAS), University of the Western Cape, Cape Town.
- Skoufias, E. (2007). "Poverty alleviation and consumption insurance: Evidence from PROGRESA in Mexico." *Journal of Socio-Economics*, Vol. 36(4): 630-649.
- Smit, B., O. Pilifosova, I. Burton, B. Challenger, S. Huq, R.J.T. Klein and G. Yohe, 2001. Adaptation to climate change in the context of sustainable development and equity. *Climate change 2001: Impacts, Adaptation and Vulnerability. Contribution of the Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, J.J. McCarthy, O. Canziani, N.A. Leary, D.J. Dokken and K.S. White, Eds., Cambridge University Press, Cambridge, pp. 877-912.
- Smithers, J., and B. Smit., 1997. Human adaptation to climatic variability and change. *Global Environmental Change*, 7(2), 129–146
- Stakhiv, E.Z., 1994. Managing water resources for adaptation to climate change. *Engineering Risk in Natural Resources Management*, 275, 379–264
- Stal, M., 2011. Flooding and relocation: The Zambezi River Valley in Mozambique. Blackwell Publishing Ltd, Oxford, UK: *International Migration Vol. 49 (IS) 2011*.
- Streeck, W. and K. Thelen., 2005. Institutional Changes in Advanced Political Economies’ in W. Streeck and K. Thelen (eds.), *Beyond Continuity: Institutional Change in Advanced Political Economies*, Oxford: Oxford University Press, pp. 1–39.
- Swennenhuis, J., 2012. Food security strategies in the Kazungula and Zambezi Heartlands, and their link with conservation impact and climate change. Africa Biodiversity Collaborative Group. September, 2012

- Tadesse, D., 2010. The impact of climate change in Africa. Institute for Security Studies. South Africa, Pretoria
- Tadross, M.A., B.C. Hewitson, and M.T. Usman., 2005. The inter-annual variability of the onset of the maize growing season over Southern Africa and Zimbabwe. *J. Climate*, 18, 3356 – 3372
- Tembo. O., 2011. Climate change adaptation and mitigation in Zambia: An examination of policy and institutional response to environmental and human security. University for Peace. Department of Environment, Security and Peace
- Tembo, A., 2014. Characterisation of saline groundwater based on ground-based time-domain electromagnetic sounding in the Machile River Basin, South-western Zambia
- Thelen, K., 1999. 'Historical Institutionalism in Comparative Politics', *Annual Review of Political Science* 2, pp. 369–414.
- Thelen, K., 2003. 'How Institutions Evolve: Insights from Comparative-Historical Analysis' in J. Mahoney and D. Rueschemeyer (eds.), *Comparative Historical Analysis in the Social Sciences*, New York: Cambridge University Press, pp. 208–240.
- Thelen, K., 2004. *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States and Japan*, New York: Cambridge University Press.
- Thurlow, J., Zhu, T., Diao, X., 2008. The Impact of climate variability and change on economic growth and poverty in Zambia. *Food Policy*, (December), 1-71.
- Thurlow, J., J. Zhu, X. Diao., 2009. The Impact of Climate Variability and Change on Economic Growth and Poverty in Zambia. IFPRI Discussion Paper 890, IFPRI.
- Thynne, I., 2008. Climate change, governance and environmental services: Institutional perspectives, issues and challenges. *Public Administration and Development*: Charles Darwin University, Australia.
- Thompson, C., 1993. "Drought Emergency in Southern Africa: The Role of International Agencies." Paper presented at SADC Regional Drought Management Workshop, Harare, September 13–16. University of Zimbabwe, Harare.
- Tompkins, E.I., and W.N. Adger., 2004. Does adaptive management of natural resources enhances resilience to climate change? *Ecology and Society* 9 (2): 10
- Travasso, M.I., G.O. Magrin, W.E. Baethgen, J.P. Castao, G.R. Rodriguez, R. Rodriguez, J.L. Pires, A. Gimenez, G. Cunha, and M. Fernandes., 2006. Adaptation measures for

- maize and soybean in Southeastern South America. Working Paper No. 28, Assessment of impacts and Adaptations to Climate Change (AIACC), 38 pp.
- Tubiello, F.N., S. Jagtap, C. Rosenzweig, R.A. Goldberg, and J.W. Jones., 2002. Effects of climate change on US crop production from the National Assessment. Simulation results using two different GCM Scenarios. Part I: Wheat, potato, maize, and citrus, *Climate Res.*, 20, 259 – 270.
- UNDP., 2013. Climate Change for Adaptation Project, Project Brief Report – Kazungula District – Kasaya Site
- UNEP. 2007. Global Environment Outlook Environment for Development. UNEP
- UNEP. 1998. Handbook on Methods for Climate Impact Assessment and Adaptation Strategies, 2 [Feenstra, J., I. Burton, J. Smith, and R. Tol (eds.)]. United Nations Environment Program, Institute for Environmental Studies, Amsterdam, The Netherlands, 359 pp.
- UN/ISDR (Inter-Agency Secretariat of the International Strategy for Disaster Reduction), 2004: Living with Risk – A global review of disaster reduction initiatives
- UNISDR (United Nations International Strategy for Disaster Reduction). 2009. UNISDR terminology on disaster risk reduction. Geneva: UNISDR. 30 p. http://www.preventionweb.net/files/7817_UNISDRTerminologyEnglish.pdf Date of access: 8 Sep. 2011
- United Nations Secretary-General’s High-level Panel on Global Sustainability. 2012. Resilient People, Resilient Planet: A future worth choosing. New York: United Nations
- Usman, M.T., and C.J.C., Reason., 2004. Dry spell frequencies and their variability over Southern Africa, *Climate Res.*, 26, 199 – 211
- Van der Heijden J., 2011. Institutional Layering: A Review of the Use of the Concept. *Politics*: 2011 VOL 31(1), 9–18
- Wang’ati, F. J., 1996. The impact of climate variation and sustainable development in the Sudano-Sahelian region. In: *Climate Variability, Climate Change and Social Vulnerability in the Semi-Arid Tropics* [Ribot, J. C., A. R. Magalhaes, and S.S. Panagides (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 71-91
- WaterAid., 2010. WaterAid Zambia Country Strategy - 2011-2015. December, 2010

- Weber, M., 1978. *Economy and Society: An Outline of Interpretive Sociology*. Berkley, CA: U. California Press, pp. 24-6, 215-6, 217, 223-6, 237-8, 241-6, 251-4, 26670.
- Wisner, B., P. Blaikie, T. Cannon, and I. Davis., (2nd Ed.) 2003. *At Risk: Natural hazards, people's vulnerability and Disasters*.
- WMO/GWP., 2004. *Integrated Flood Management Case Study Zimbabwe: Flood management practices – selected flood prone areas Zambezi Basin*. January 2004
- World Resources Institute (WRI) in Collaboration with United Nations Development Programme, United Nations Environment Programme, and World Bank. 2011. *World Resources 2010 – 2011: Decision Making in a Changing Climate – Adaptation Challenges and Choices*. Washington, DC: WRI
- Yamano, T., H. Alderman, and L. Christiaensen., 2005. "Child Growth, Shocks, and Food Aid in Rural Ethiopia." *American Journal of Agricultural Economics* 87, no. 2 : 273-88.
- Yin, R. K., 2009. *Case study research: Design and methods* (4th ed. Vol. 5). Thousand Oaks, CA: Sage Publications.
- Zambia Team. 2012. *Workshop proceedings of the climate change and rural institutions project in Kazungula and Sesheke Districts*. 25th to 26th June, 2012. Zambia
- Zambia Vulnerability Assessment Committee. 2007. *Rapid Flood Impact Assessment Report*. March, 2007. Lusaka
- Zambia Vulnerability Assessment Committee. 2008. *Multi-Sector Vulnerability and Needs Technical Report*. June, 2008. Lusaka.
- Zambia Vulnerability Assessment Committee. 2009. *2009 In-depth Vulnerability and Needs Technical Report*. June 2009. Lusaka.

APPENDICES

APPENDIX 1: LIST OF KEY INFORMANTS INTERVIEWED IN KAZUNGULA DISTRICT

SN	PERSON	INSTITUTION	DESIGNATION
1.	Mr. Siachinji Muleya	Kazungula District Administrative Office	Retired District Administrative Officer
2.	Mr. Moono Mutambwa	Zambia Red Cross Society	Field Officer
3.	Mr. Rex Mukunta	Forestry Department	Officer in Charge
4.	Mr. Grey Kaowo	Department of Agriculture	Agricultural Camp Officer – Sikaunzwe
5.	Mr. Gisford Muleya	Kazungula District Council	Community Development Officer
6.	Mr. Happy James Tumwabaze	Kazungula District Council	Decentralisation Adviser
7.	Mr. Sekute Edwin	Sekute Community Conservancy Trust	Chairperson – SCDT
8.	Mr. Alfred Mulele	Sekute Community Conservancy Trust	Farmer’s Chairperson
9.	Mr. Likando	Namapande Community	Community Representative
10.	Mr. Kapalu Nyamozhi	Namapande Community	Community Health Worker
11.	Mr. Choonze	Namapande Community	Secretary – Farmers Coordinating Committee (FCC)
12.	Dr. Jackson Soko	Department of Agriculture	District Agricultural Coordinating Officer (DACO)
13.	Silvasy Shibulo	Department of Agriculture	Crop Husbandry Officer
14.	Mr. Kelyson Mangola	Kazungula District Council	Physical Planner
15.	Mr. Trediny Mungabwa	Namapande Community	Community Chairperson

APPENDIX 2: LIST OF KEY INFORMANTS INTERVIEWED IN SESHEKE DISTRICT

SN	PERSON	INSTITUTION	DESIGNATION
1.	Mr. Mwandamena	Ministry of Agriculture and Livestock	District Administrative and Coordinating Officer (DACO)
2.	Mr. Given Muleya	Sesheke District Council	Council Secretary
3.	Mr. Mwalindu	National Assembly	Professional Assistant
4.	Dr. Webster Chikampa	Department of Livestock	District Veterinary Officer
5.	Mr. Ackson Chiyombe	Corridors of Hope	Site Manager
6.	Mr. Luguru Kingoe	Corridors of Hope	Site Monitoring and Evaluation officer
7.	Ms. Sandie Chanda	Actionaid	LRP Manager
8.	Mr. Kawana	Department of Community Development	Community Development Officer
9.	Mr. Humphrey Mubita	Department of Water Affairs	District Water Officer
10.	Mr. Kenny Mutambekwa	Sesheke District Council	Council Chairman
11.	Ms. Patricia Kalipa	Zambia Wildlife Authority	District Officer
12.	Mr. Chipango Kamboyi	Wildlife Fund for Nature Foundation (WWF)	Research Assistant
13.	Mr. Inambo Nalumino	Forestry Department	District Forest Officer
14.	Mr. Moses Katongo	Fisheries Department	Officer
15.	Mr. Nsangu	Fisheries Department	Officer
16.	Mr. Litiya	Fisheries Department	Officer
17.	Mr. Kennedy Mundia	Zambia National Farmers Union	District Coordinator
18.	Ms. Ngula Ikafa Mubonda	Wildlife Fund for Foundation (WWF)	Project Coordinator
19.	Mr. Chrispine Miyanda	Wildlife Fund for Foundation (WWF)	Intern
20.	Mr. Chikanya	Sesheke Ward	Area Development Councillor – Chairperson
21.	Mr. Rodwell Muntanga	Department of Agriculture	District Marketing and Development Officer
22.	Maambo Pius	Department of Agriculture	Senior Agriculture Officer (SAO)
23.	Ms. Musonda Mwenda	Department of Community Development	Community Development Officer
24.	Mr. Siyumpwa Kabisa	District Administration	District Administrative Officer (DAO)

APPENDIX 3: LIST OF KEY INFORMANTS INTERVIEWED – PROVINCIAL AND NATIONAL LEVEL

SN	PERSON	INSTITUTION	DESIGNATION
1.	Mr. Wisford Mudenda	Zambia Red Cross Society – Lusaka	Disaster Management Coordinator
2.	Mr. Kangomba	Department of Water Affairs – Lusaka	Director
3.	Mr. David Kaluba	Ministry of Finance and National Planning – Lusaka	Principal Economist
4.	Mr. Iretomiwa Olutunji	The World Bank – Lusaka	Climate Adaptation Operations Officer – AFTN 1
5.	Mr. Victor Musumali	Carritas – Livingstone	
6.	Mr. Richard Nambwalu	Ministry of Agriculture and Cooperatives – Livingstone	District Administrative and Coordinating Officer (DACO)
7.	Ms. Josephine Mbewe	Forestry Department – Livingstone	District Forest Officer
8.	Mr. Munalula Mate	Meteorological Department – Livingstone	Director
9.	Mr. Donald Lubambe	Forestry Department – Livingstone	Forestry Officer
10.	Mr. Muntali	Ministry of Agriculture and Livestock – Livingstone	Provincial Administrative Officer
11.	Mr. Nkaba	Ministry of Agriculture and Livestock – Livingstone	Agriculturalist
12.	Mr. Jones Musonda	African Wildlife Foundation	Ecologist – Kazungula Heartlands
13.	Ms. Perrin Banks	African Wildlife Foundation	Program Design Officer
14.	Mr. Harrison Nyirenda	Department of Water Affairs – Livingstone	District Water Officer
15.	Mr. Chilongo	Zambia Environmental Authority (ZEMA) – Livingstone	Planner
16.	Mr. Simachila Westone Siachongwe	Response Network – Livingstone	Project Coordinator
17.	Ms. Bwalya Simwangala	Community Based Natural Resource Management	Programme Manager

APPENDIX 4: LIST OF FIRST MEETING ATTENDANTS – KAZUNGULA DISTRICT

No.	Name	Organisation/Responsibility
1.	Happy James Tumwebaze	Decentralisation Advisor
2.	Nathaniel M’kuzo M’kuzo	PSRD – NGO
3.	Rabecca Tembo	Ministry of Energy and Water Development/ Rural Water Officer
4.	Mbewe Josephine	Forestry Department
5.	Lapila Chirwa	Ministry of Health
6.	Titus Chilongo	Zambia Wildlife Authority
7.	Munalula Mate	Meteorological Department
8.	Carol E. Mweemba	UNZA – IWRM Centre
9.	Harrison Nyirenda	Department of Water Affairs/ District Water Officer
10.	Mvula Benjamin N.	Ministry of Agriculture and Cooperatives
11.	Pascalina B. Musokotwane	District Administration Office/ District Commissioner
12.	Muleya Siachinji	District Administration Office / District Administrative Officer
13.	Alfred Mulele	Sekute Community Trust/ Chairperson
14.	James Musonda	Mosi-o-Tunya Radio Station
15.	Sakala Samson D	District Education Board
16.	Raphael Zulu	Kazungula District Council / Council Secretary
17.	Gisford Muleya	Community Development Officer
18.	Perrin Banks	African Wildlife Foundation
19.	Jones Musonde	African Wildlife Foundation
20.	Joreck Chishika	Zambia Wildlife Authority
21.	Moono Mutambwa	Zambia Redcross Society
22.	Namakau Muhau Hantembe	Zambia National Information Service (ZANIS)
23.	Mikkel Funder	DIIS – Denmark
24.	Imasiku A. Nyambe	UNZA – IWRM Centre
25.	Deon Mulela	Zambian People living with HIV/AIDS NZPT
26.	Edwin Sekute	Sekute Community Trust / Secretary
27.	Alexander Mutali	Ministry of Agriculture and Cooperatives
28.	Liftery Ndaba	Works and Supply/ Director

APPENDIX 5: LIST OF FIRST MEETING ATTENDANTS – SESHEKE DISTRICT

No.	Name	Organisation
1.	Ms. Faustina Simasiku	Sesheke District Council
2.	Ms. Patricia C. Kalipa	Zambia Wildlife Authority
3.	Mr. Chibuye Paul Lee	Forestry Department
4.	Mr. Mubonda Katukula	Ministry of Education
5.	Ms. Carol E.Mweemba	UNZA – IWRM Centre
6.	Prof. Imasiku A. Nyambe	UNZA – IWRM Centre
7.	Dr. Mikkel Funder	DIIS
8.	Mr. Nawa Maswabi	Ministry of Education
9.	Mr. Donald Namushi	African Wildlife Foundation
10.	Mr. Imataa Musialela	Ministry of Education
11.	Dr. Webster Chikampa	Department of Veterinary Medicine
12.	Mr. Frank Kufakwandi	Consultant
13.	Mr. Muyangana Mwandamena	Ministry of Agriculture and Livestock
14.	Mr. Munalula Linbuwe	ICDT – Mwandi
15.	Mr. Mikelarai Muyunda	Mwandi Integrated Fish Farm – Mwandi
16.	Mr. Simon Moosho Mahanyi	Zambia Redcross Society
17.	Mr. Kanyemba Chimuka	Ministry of Community Development and Social Services
18.	Mr. Brain Kashimoto	Social Welfare
19.	Ms. Melody Nchima	Forestry Department
20.	Ms. Musonda Mwenda	Ministry of Community Development and Social Services
21.	Martin M. Mutale	Sesheke District Council
22.	Mr. Siyumpwa Kabisa	District Administration
23.	Mwiya B. Mwiya	Ministry of Health
24.	Kabiti Reuben	Ministry of Agriculture and Livestock
25.	Mwala M. Victor	Zambia National Information Services (ZANIS)
26.	Maambo Pius H.	Ministry of Agriculture and Livestock
27.	Mubita Humphrey	Department of Water Affairs
28.	Petrina Sulapwa	Ministry of Health
29.	Mwalindu Shokile	National Assembly / ZRCS

**APPENDIX 6: LIST OF SECOND MEETING ATTENDANTS –
KAZUNGULA DISTRICT**

No.	Name	Organisation
1.	Simachila Westone Siachongwe	Response Network
2.	Emmanuel Mudenda	Zambia Red Cross Society
3.	Gisford Muleya	Kazungula District Council
4.	Rebecca Tembo	Kazungula District Council
5.	Nathaniel Mkuzo	PSRD – NGO
6.	Kantu Kantu	Ministry of Agriculture
7.	Josephine Mbewe	Forestry Department
8.	Munalula Mate	Meteorological Department
9.	Carol Mweemba	UNZA – IWRM Centre
10.	Mikkel Funder	DIIS
11.	Prof Imasiku Nyambe	UNZA – IWRM Centre
12.	Alfred Mulele	Sekute Community Conservancy Trust
13.	Grey Kauwo	Department of Agriculture
14.	Lubambe Donald	Forestry Department
15.	Patrick Chisenga	Kazungula District Council
16.	Julius Simfukwe	Kazungula District Council
17.	Bwalya Simwangala	Community Based Natural Resource Management
18.	Mang'ola Kelyson	Kazungula District Council

APPENDIX 7: LIST OF SECOND MEETING ATTENDANTS – SESHEKE DISTRICT

No.	Name	Organisation
1.	Wendy Mwaka Musiwa	WWF
2.	Timothy S. Simpindu	Zambia Red Cross
3.	Petrina Siulapwa	Ministry of Health
4.	Mubita Humphrey	Department of Water Affairs
5.	Katongo Moses	Livestock and Fisheries
6.	Shupekile Mwale	Ministry of Culture and Arts
7.	Marjorie M. Nyambe	Ministries of Chiefs and Traditional Affairs
8.	Kapanda Kapanda	Ministry of Works and Supply
9.	Faustina Simasiku	Sesheke District Council
10.	Frank Kufakwandi	Consultant
11.	Mikkel Funder	DIIS
12.	Prof Imasiku A. Nyambe	UNZA- IWRM Centre
13.	Mwalindu Shokile	National Assembly
14.	Ernest Hamalila	Sesheke District council
15.	Roy Moonde	Ministry of Agriculture and Livestock
16.	Greenford Nchukwa	Sesheke District Health Office
17.	Siamalambo Amon	Ministry of Agriculture and Livestock
18.	Sibanda Sabelo	Zambia Red Cross
19.	David Mwanamambo	Action Aid Zambia
20.	Chimuka Kanyemba	Ministry of Community Development and Social Services
21.	Sinkamba Allan	Ministry of Agriculture and Livestock
22.	Eunice Muchali	Department of Social Welfare
23.	Kenny Mundia	Zambia National Farmer's Union (ZNFU)
24.	Hughes Malakwa	
25.	Carol Mweemba	UNZA- IWRM Centre
26.	Chikampa Webster	Department of Veterinary Medicine
27.	Dumisani Sibango	Zambia Red Cross Society
28.	Muyunda Lutangu	Ward Development Committee
29.	Mr. Siyupwa Kabisa	District Administration
30.	Mr. Victor Mwala	Zambia National Information Services (ZANIS)
31.	Mr. Muyangana Mwandamena	Ministry of Agriculture and Livestock

APPENDIX 8: INTERVIEW GUIDE FOR INSTITUTIONAL RESPONDENTS AT NATIONAL AND PROVINCIAL LEVEL

THEME	QUESTIONS
Overall history and status of the climate change agenda in the country	<ul style="list-style-type: none"> - In the last two decades, what has been the climatic trend in Zambia? You could split your answer in years; say from 1990 to 1999 etc. - Is there a point in time (say year) when you could say you started seeing some changes occurring in Zambia? - What kind of changes were these and in which areas where they noted? - At what point did the national government start to talk about these changes in the country? - At what point were these climatic changes seen as national concerns? - When did the issue of climate change come to be included in the national policies and plans?
Brief description of the state and governance system	<ul style="list-style-type: none"> - How has the governance system in place responded to these changes nationally? - So far, what has been done to respond to changes in climate in Zambia? - At what stage is Zambia implementing climate change adaptation measures? - Which processes and at which stage are line ministries involved?
Key climate change policies, plans, and authorities.	<ul style="list-style-type: none"> - What policies and plans are in place in support of climate change adaptation in Zambia? - Who and which institutions are in charge of and implementing these policies?
History of the local level governance system/landscape in the country	<ul style="list-style-type: none"> - Would you give a description of the local level governance system in the country - How about in the district? - Historically, what have been the roles and responsibilities of the local governance system? - In present day, what are the roles and responsibilities of the local governance system in general and climate change specifically? - What has been their source of funding in implementing their activities? - Is the local governance working on climate change and adaptation related issues? - Are there linkages with local leadership and communities working on climate change adaptation? What is their input? - Have there been linkages to other institutions? (governmental and nongovernmental) - Is there conflict of roles and responsibilities in working on climate change adaptation? If so, how do you harmonise the conflicts?

APPENDIX 9: INTERVIEW GUIDE FOR INSTITUTIONAL RESPONDENTS AT DISTRICT LEVEL ON GOVERNANCE AND CLIMATE CHANGE AGENDA.

THEME	QUESTIONS
Overall history and status of the climate change agenda in the country	<ul style="list-style-type: none"> - In the last two decades, what has been the climatic trend in Zambia? You could split your answer in years; say from 1990 to 1999 etc. - Is there a point in time (say year) when you could say you started seeing some changes occurring in Zambia? - What kind of changes were these and in which areas were they noted? - At what point did the national government start to talk about these changes in the country? - At what point were these climatic changes seen as national concerns? - When did the issue of climate change come to be included in the national policies and plans?
Brief description of the state and governance system	<ul style="list-style-type: none"> - How has the governance system in place responded to these changes nationally? - So far, what has been done to respond to changes in climate in Zambia? - At what stage is Zambia implementing climate change adaptation measures? - Which processes and at which stage are line ministries involved?
Key climate change policies, plans, and authorities.	<ul style="list-style-type: none"> - What policies and plans are in place in support of climate change adaptation in Zambia? - Who and which institutions are in charge of and implementing these policies?
History of the local level governance system/landscape in the country	<ul style="list-style-type: none"> - Would you give a description of the local level governance system in the country - How about in the district? - Historically, what have been the roles and responsibilities of the local governance system? - In present day, what are the roles and responsibilities of the local governance system in general and climate change specifically? - What has been their source of funding in implementing their activities? - Is the local governance working on climate change and adaptation related issues? - Are there linkages with local leadership and communities working on climate change adaptation? What is their input? - Have there been linkages to other institutions? (governmental and nongovernmental) - Is there conflict of roles and responsibilities in working on climate change adaptation? If so, how do you harmonise the conflicts?

Description of key relevant non-state actors (NGOs, private sector, Donors, etc)	<ul style="list-style-type: none"> - What are the key institutions (NGOs, private sector, donors) in the district working on climate change adaptation and related topics? - What is it that they actually do? - For how long have they been working on climate change and related issues? - What has been their source of funding? - Have their not been duplication of effort with national or district institutions in implementing their activities? - How does the district harmonise conflict of responsibilities and roles?
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APPENDIX 10: INTERVIEW GUIDE FOR INSTITUTIONAL RESPONDENTS AT DISTRICT LEVEL ON INSTITUTIONAL SUPPORT TO CLIMATE CHANGE IN THE STUDY AREAS

THEME	QUESTIONS
Mapping of the various formal mandates and functions of district level institutions in relation to climate hazards:	<ul style="list-style-type: none"> - What kinds of disasters occur in the district? - What kinds of activities are put in place to respond to such disasters? - Which institutions / agencies are responsible for particular disasters in the district - What is the source of funding used to respond to particular disasters in the District?
Description of the actual work tasks and informal relationships (or lack of these) of local organizations in relation to climate change adaptation.	<ul style="list-style-type: none"> - What are your work roles as an individual in responding to climate change adaptation in the district? E.g. what do you do to respond to extreme events like flooding or drought? - What are your institutional roles in responding to climate change adaptation in the district? E.g. how does your institution respond to extreme events like flooding or drought? - Which institutions do you work closely with to respond to climate change adaptation (i) at district level and (ii) at national level? - Are there conflict of roles and responsibilities between and among institutions you work with? (Whether governmental or nongovernmental) in implementing activities in climate change adaptation? - (If any) how do you harmonize the conflicts of roles and responsibilities?
Geographical and biophysical context and change in the study areas	<ul style="list-style-type: none"> - What is and has been the geographical situation in the district? - Are there notable changes in the geographical and biophysical context of the district in the last 2 decades? - What prominent thing have you noticed to be different now? - What does this imply for natural resources management? - Which natural resources, productive assets and financial resources in the area are important for livelihood? (Source of income for people) - Are there excesses or limitations in the natural resources as a consequence of climate change? - What are people doing to adapt to these changes? - What are you doing as an institution to improve adaptation measures among community members? - Are your recommendation measures to climate change adaptation effective? Or are they improving livelihood and wellbeing of the people?
Major extreme events related to climate change	<ul style="list-style-type: none"> - Give a historical layout of events of floods and droughts that you can recall to have occurred in the district?

(specific floods and droughts over the years).	<ul style="list-style-type: none"> - What are the associated impacts of these extreme events related to climate change? - What are the coping strategies to climate change adaptation currently being employed in the district?
Projects/interventions, synergies and barriers to climate change adaptation	<ul style="list-style-type: none"> - What are the proposed adaptation projects in the area? - What issues or developments in the area might hinder the implementation of the project? (local needs, local capacities, financial, political, institutional support etc.) - What issues or developments in the area might support the implementation of the project? (e.g. local needs, local capacities, financial, political, institutional support etc.)
Provide information on the on-going projects/ programs as well as the implementing institutions in the area that (for each project provide the following information – focus and ability):	<ul style="list-style-type: none"> a) increase crop production/ productivity b) increase livestock production c) Increase fish production? d) Increase clean water supply? e) Increase market access?
For each of the identified project/ intervention above, also provide the following information	<ul style="list-style-type: none"> - Coverage of these programs - Core intervention activities - implementation approach/modalities - What are the existing barriers to the effective implementation of these activities? - Potential for up-scaling of activities (analysed in relation to area available for this and management challenges?) - Community demand for up-scaling of these activities (e.g. required increase in area) - What is the cost of undertaking the activities (e.g. per hectare or per household/annum)

APPENDIX 11: HOUSEHOLD QUESTIONNAIRE ON INSTITUTIONAL SUPPORT TO LOCAL CLIMATE CHANGE ADAPTATION AND COMMUNITY RESPONSES IN KAZUNGULA AND SESHEKE DISTRICTS

QUESTIONNAIRE IDENTIFICATION_TO BE COMPLETED BY INTERVIEWER		
Household number:		
Enumerator name or initials:		
District Name:		
Ward Name:		
Community Name:		
Date of interview:		
Time of start of interview: (Use format e.g. 15:20)	Start	
	Finish	
CONSENT FORM		
<p><i>Please read /explain the following consent form:</i></p> <p>“My name is _____. We are collecting information regarding climate variations and changes (i.e. floods & droughts) and how institutions (i.e. the government and NGOs) in the area have assisted the communities to adapt. The information required is for academic purposes and I would like to ask you to participate in a one-on-one interview about your household experiences on issues of climate change. There are no wrong answers to the questions that will be asked. Please answer all questions truthfully.</p> <p>Please, be informed that all information and responses that we will get from you will be kept confidentially and only researchers involved in this study will view the discussion notes. Please, also note that there is no direct benefit to you in participating to this study, but it is a way of helping us understand the climate change situation in this area.</p> <p>Your participation is voluntary. You may refuse to answer any question and you may choose to stop the discussion at any time. Refusing to participate will not affect you or your family in any way.</p> <p>Do you have any questions for us? You may ask questions about this study at any time.</p> <p>May I begin the interview now?” Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Signature of Interviewer: _____</p>		
SECTION I: DEMOGRAPHICS, EDUCATION, RESIDENCE AND ECONOMIC ACTIVITIES OF THE HOUSEHOLD ³¹		

³¹ A household is defined as a group of people currently living and eating together “under the same roof” (or in the same compound if the household has more structures), and stays for at least 6 months together

DEMOGRAPHICS OF RESPONDENTS BEING INTERVIEWED				
1.1	What is your name/are your name(s)?	_____		
1.2	Sex of respondent(s) <i>Don't ask, just note!</i>	<input type="checkbox"/> 1. Male <input type="checkbox"/> 2. Female <input type="checkbox"/> 3. Couple – male and female		
1.3	Are you the household head(s)?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No		
1.4	<i>If the household head is not among the respondents:</i> What is the name of the household head?	_____		
1.5	What is the marital status of the household head?	<input type="checkbox"/> 1. Married <input type="checkbox"/> 2. Divorced <input type="checkbox"/> 3. Living apart, not divorced <input type="checkbox"/> 4. Widow or widower <input type="checkbox"/> 5. Never married		
1.6	What is the ethnicity of the household?	<input type="checkbox"/> 1. Lozi <input type="checkbox"/> 2. Mbunda <input type="checkbox"/> 3. Luvale <input type="checkbox"/> 4. Chokwe <input type="checkbox"/> 5. Tonga <input type="checkbox"/> 6. Toka Leya <input type="checkbox"/> 7. Nkoya <input type="checkbox"/> 8. Bemba <input type="checkbox"/> 9. Nyanja (Chewa, Ngoni etc) <input type="checkbox"/> 10. Other, <i>please specify</i> _____		
1.7	Enter the number of people living permanently in the household by gender and age group	Age	Male	Female
		0 – 10 years		
		11 – 17 years		
		18 – 55 years		
1.8	How old is the household head?	<input type="checkbox"/> 1. Below 18 years old <input type="checkbox"/> 2. Between 18 to 25 years old <input type="checkbox"/> 3. Between 26 to 45 years old <input type="checkbox"/> 4. Between 45 to 60 years old <input type="checkbox"/> 5. Above 60 years old		
		<input type="checkbox"/> 1. 17 years old <input type="checkbox"/> 2. 16 years old <input type="checkbox"/> 3. 15 years old <input type="checkbox"/> 4. Below 15 years old <input type="checkbox"/> 5. N/A		
1.9	If answer to question 1.8 is option 1 (below 18 years), how old is the household head?	<input type="checkbox"/> 1. 17 years old <input type="checkbox"/> 2. 16 years old <input type="checkbox"/> 3. 15 years old <input type="checkbox"/> 4. Below 15 years old <input type="checkbox"/> 5. N/A		
LITERACY AND EDUCATION				

1.10	What is the level of education of the household head?	<input type="checkbox"/> 1. None <input type="checkbox"/> 2. Some primary (but not finished grade 7) <input type="checkbox"/> 3. Completed primary – Grade 7 <input type="checkbox"/> 4. Completed Lower secondary – Grade 9 <input type="checkbox"/> 5. Completed Upper secondary – Grade 12 <input type="checkbox"/> 6. Vocational school <input type="checkbox"/> 7. Tertiary level (college, university, technical, etc.) <input type="checkbox"/> 8. Other, <i>please specify</i> : _____ <input type="checkbox"/> 9. I don't know
1.11	What is the level of education of the spouse to the household head?	<input type="checkbox"/> 1. None <input type="checkbox"/> 2. Some primary (but not finished grade 7) <input type="checkbox"/> 3. Completed primary – Grade 7 <input type="checkbox"/> 4. Completed Lower secondary – Grade 9 <input type="checkbox"/> 5. Completed Upper secondary – Grade 12 <input type="checkbox"/> 6. Vocational school <input type="checkbox"/> 7. Tertiary level (college, university, technical, etc.) <input type="checkbox"/> 8. Other, <i>please specify</i> : _____ <input type="checkbox"/> 9. I don't know
RESIDENCE STATUS		
1.12	How long have you been living in this village <i>If the answer is option 8, proceed to question 1.17!</i>	<input type="checkbox"/> 1. 0 – 1 year <input type="checkbox"/> 2. 1 – 2 years <input type="checkbox"/> 3. 2 – 5 years <input type="checkbox"/> 4. 5 – 10 years <input type="checkbox"/> 5. 10 – 15 years <input type="checkbox"/> 6. 15 – 20 years <input type="checkbox"/> 7. More than 20 years <input type="checkbox"/> 8. Born here <input type="checkbox"/> 9. I don't know
1.13	When you first came here, where did you move from?	<input type="checkbox"/> 1. Within the same district, but from another village <input type="checkbox"/> 2. Within the same province <input type="checkbox"/> 3. From another province (neighbouring) <input type="checkbox"/> 4. From another province (not neighbouring) <input type="checkbox"/> 5. From abroad <input type="checkbox"/> 6. N/A
1.14	What was the reason for moving?	<input type="checkbox"/> 1. Better access to land <input type="checkbox"/> 2. Better access to roads <input type="checkbox"/> 3. Better access to health centres and/or schools <input type="checkbox"/> 4. Less exposure to drought conditions <input type="checkbox"/> 5. Less exposure to floods <input type="checkbox"/> 6. Less exposure to extreme temperatures <input type="checkbox"/> 7. Part of government programme <input type="checkbox"/> 8. Better access to river or water sources <input type="checkbox"/> 9. Other, <i>please specify</i> _____ <input type="checkbox"/> 10. N/A <i>Tick more than one option if applicable!</i>
1.15	Did you receive any support in your relocation?	<input type="checkbox"/> 1. Yes

	<i>If answer is option 2, proceed to question 1.17!</i>	<input type="checkbox"/> 2. No <input type="checkbox"/> 3. N/A			
1.16	What kind of support did you receive?	<input type="checkbox"/> 1. Building material <input type="checkbox"/> 2. Money <input type="checkbox"/> 3. Land <input type="checkbox"/> 4. Agricultural inputs <input type="checkbox"/> 5. Skills training <input type="checkbox"/> 6. Food <input type="checkbox"/> 7. Other, please specify _____ <input type="checkbox"/> 8. N/A <i>Tick more than one option if applicable!</i>			
1.17	Did any household members migrate in the last 5 years? <i>If the answer is option 2 or 3, proceed to question 1.19!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know			
1.18	If yes, please complete table on the right for each migrated member	Person	Age	Gender	Reason for migrating
		1			
		2			
		3			
Codes for reasons to leave 1 = to find better farming land 2 = government/NGO resettlement programme 3 = moving away from flood prone area 4 = moving away from drought prone area 5 = to do non-agricultural work else where 6 = lack of land to farm 7 = education 8 = to work in town within the Country 9 = to work abroad 10 = to relieve strain on family 11 = other, please specify _____ 12 = N/A					
ECONOMIC ACTIVITIES					
1.19	What is (are) the main economic activities of the household head? <i>Rank the first three main economic activities of the household head in order of importance.</i>	<input type="checkbox"/> 1. Farming <input type="checkbox"/> 2. Fishing <input type="checkbox"/> 3. Vegetable growing <input type="checkbox"/> 4. Informal employment - Day labour, domestic worker <input type="checkbox"/> 5. Formal employment <input type="checkbox"/> 6. Forestry/Conservancy <input type="checkbox"/> 7. Retired / too weak to work <input type="checkbox"/> 8. Full time student <input type="checkbox"/> 9. Other, please specify _____			

1.20	Is there any other adult member of the household who supports the household? <i>If answer is option 2 or 3, proceed to question 2.1!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know																								
1.21	What is (are) the main economic activities of the adult family member who also supports the household? <i>Rank the first three main economic activities of the household head in order of importance.</i>	<input type="checkbox"/> 1. Farming <input type="checkbox"/> 2. Fishing <input type="checkbox"/> 3. Vegetable growing <input type="checkbox"/> 4. Informal employment – Day labour, domestic worker etc. <input type="checkbox"/> 5. Formal employment <input type="checkbox"/> 6. Forestry/ Conservancy <input type="checkbox"/> 7. Retired / too weak to work <input type="checkbox"/> 8. Full time student <input type="checkbox"/> 9. Other, <i>please specify</i> _____ <input type="checkbox"/> 10. N/A																								
SECTION II: CLIMATE CHANGE AND WATER																										
CLIMATE CHANGE AND WATER ACCESS																										
2.1	What is your most important source of domestic water?	<input type="checkbox"/> 1. Open source (river/stream/lake/wetland) <input type="checkbox"/> 2. Rain harvesting <input type="checkbox"/> 3. Water hole/ scoop <input type="checkbox"/> 4. Shallow well <input type="checkbox"/> 5. Deep unprotected well <input type="checkbox"/> 6. Deep protected well <input type="checkbox"/> 7. Hand pump <input type="checkbox"/> 8. Tap water supplied by service provider <input type="checkbox"/> 9. Other, <i>please specify</i> _____																								
2.2	Is your main source of water available through-out the year? <i>If the answer is option 2, proceed to question 3.1!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No																								
2.3	Indicate months when the most important source of water is unavailable.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">January</td> <td style="width: 25%;"></td> <td style="width: 25%;">July</td> <td style="width: 25%;"></td> </tr> <tr> <td>February</td> <td></td> <td>August</td> <td></td> </tr> <tr> <td>March</td> <td></td> <td>September</td> <td></td> </tr> <tr> <td>April</td> <td></td> <td>October</td> <td></td> </tr> <tr> <td>May</td> <td></td> <td>November</td> <td></td> </tr> <tr> <td>June</td> <td></td> <td>December</td> <td></td> </tr> </table>	January		July		February		August		March		September		April		October		May		November		June		December	
January		July																								
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June		December																								
2.4	What is the cause for the unavailability of your primary water source in some months during the year? <i>If the answer is option 3, proceed to question 2.11; and</i>	<input type="checkbox"/> 1. It dries out <input type="checkbox"/> 2. Only allowed to use it when there is sufficient water <input type="checkbox"/> 3. It gets flooded <input type="checkbox"/> 4. Breaks down due to overuse <input type="checkbox"/> 5. I don't know																								

	<i>if its options 2,4,5,6 or 7, proceed to question 3.1!</i>	<input type="checkbox"/> 6. Other, please specify _____ <input type="checkbox"/> 7. N/A <i>Tick more than one option if applicable!</i>
2.5	If your answer is option 1 to question 2.4 (water sources dry out), how many years have you been experiencing this scenario?	<input type="checkbox"/> 1. Less than 2 years <input type="checkbox"/> 2. Between 2 and 5 years <input type="checkbox"/> 3. Between 5 and 10 years <input type="checkbox"/> 4. Between 10 and 20 years <input type="checkbox"/> 5. More than 20 years <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. N/A – Never dries out
2.6	What do you think is the cause for the drying out condition of your primary water source?	<input type="checkbox"/> 1. Reduced rainfall over the years <input type="checkbox"/> 2. Drought conditions <input type="checkbox"/> 3. Siltation <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, please specify _____ <input type="checkbox"/> 6. N/A <i>Tick more than one option if applicable!</i>
2.7	Is the drying out of your water sources problematic to your household's wellbeing? <i>If your answer is option 2 and 3, proceed to question 2.11!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
2.8	In what way is the drying out of water sources problematic to your household's wellbeing?	<input type="checkbox"/> 1. Cover longer distances to access water <input type="checkbox"/> 2. Insufficient sources for all community needs <input type="checkbox"/> 3. Denied access from private sources <input type="checkbox"/> 4. Long queues of people at available sources <input type="checkbox"/> 5. Fail to do water animals adequately <input type="checkbox"/> 6. Fail to grow vegetables <input type="checkbox"/> 7. Fish sources no longer available <input type="checkbox"/> 8. Competition for water with livestock, gardens and domestic use <input type="checkbox"/> 9. Too many conflicts in water access <input type="checkbox"/> 10. Other, please specify _____ <input type="checkbox"/> 11. N/A
2.9	If the drying out of water sources is problematic to your household's well-being, what have you done as a household to respond to the problem of drying water sources?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Asked government/NGOs for deeper sources <input type="checkbox"/> 3. Re-deepened our sources <input type="checkbox"/> 4. Stopped growing vegetables <input type="checkbox"/> 5. Stopped rearing livestock <input type="checkbox"/> 6. Migrated our livestock to other water sources <input type="checkbox"/> 7. Migrated home to places with water <input type="checkbox"/> 8. Other, please specify _____ <input type="checkbox"/> 9. N/A
2.10	What challenges have you experienced in responding to	<input type="checkbox"/> 1. Lack of support from government/NGOs <input type="checkbox"/> 2. Lacks of funds to re-deepen available sources

	the problem of drying out water sources?	<input type="checkbox"/> 3. Lack of income to due to migrated livestock <input type="checkbox"/> 4. Lack of income due to limited fishing activities <input type="checkbox"/> 5. Lack of income due to limited gardening activities <input type="checkbox"/> 6. Lack of suitable land for relocation <input type="checkbox"/> 7. Other, please specify _____ <input type="checkbox"/> 8. N/A
2.11	If your source gets flooded (option 3 for question 2.5), how many years have your been experiencing this scenario?	<input type="checkbox"/> 1. Less than 2 years <input type="checkbox"/> 2. Between 2 and 5 years <input type="checkbox"/> 3. Between 5 and 10 years <input type="checkbox"/> 4. Between 10 and 20 years <input type="checkbox"/> 5. More than 20 years <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. N/A – Never gets flooded
2.12	What do you think is the cause for the flooding condition of your primary water source?	<input type="checkbox"/> 1. Too much rains during the rainy season <input type="checkbox"/> 2. Bursting of the local rivers <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. Other, <i>please specify</i> _____ <input type="checkbox"/> 5. N/A <i>Tick more than one option if applicable!</i>
2.13	Is the flooding of your water sources problematic to your household's wellbeing? <i>If your answer is option 2 and 3, proceed to question 2.17!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
2.14	In what way is the flooding of water sources problematic to your household's wellbeing?	<input type="checkbox"/> 1. Cover longer distances to access water <input type="checkbox"/> 2. Insufficient sources for all community needs <input type="checkbox"/> 3. Denied access from private sources <input type="checkbox"/> 4. Long queues of people at alternative available sources <input type="checkbox"/> 5. Children at risk of drowning <input type="checkbox"/> 6. Used of unclean sources for drinking <input type="checkbox"/> 7. Competition for water with livestock, gardens and domestic use <input type="checkbox"/> 8. Too many conflicts in water access <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. N/A
2.15	If the flooding of water sources is problematic to your household's well being, what have you done as a household to respond to the problem of flooded water sources?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Asked government/NGOs for deeper sources <input type="checkbox"/> 3. Used alternative <input type="checkbox"/> 4. Continued to used flooded water source growing vegetables <input type="checkbox"/> 5. Stopped rearing livestock <input type="checkbox"/> 6. Migrated our livestock to other water sources <input type="checkbox"/> 7. Migrated home to places with clean water <input type="checkbox"/> 8. Other, please specify _____ <input type="checkbox"/> 9. N/A

2.16	What challenges have you experienced in responding to the problem of water sources getting flooded?	<input type="checkbox"/> 1. Lack of support from government/NGOs <input type="checkbox"/> 2. Lacks of funds to dig other source <input type="checkbox"/> 3. Lack of income to due to migrated livestock <input type="checkbox"/> 4. Lack of income due to limited fishing activities <input type="checkbox"/> 5. Lack of income due to limited gardening activities <input type="checkbox"/> 6. Lack of suitable land for relocation <input type="checkbox"/> 7. Other, please specify _____ <input type="checkbox"/> 8. N/A	
2.17	When your most important source of water is unavailable, what is your alternative source of domestic water?	<input type="checkbox"/> 1. Open source (river/stream/lake/wetland) <input type="checkbox"/> 2. Rain harvesting <input type="checkbox"/> 3. Water hole/ scoop <input type="checkbox"/> 4. Shallow well <input type="checkbox"/> 5. Deep unprotected well <input type="checkbox"/> 6. Deep protected well <input type="checkbox"/> 7. Hand pump <input type="checkbox"/> 8. Tap water supplied by service provider <input type="checkbox"/> 9. Other, <i>please specify</i> _____ <input type="checkbox"/> 10. N/A	
SECTION III: CLIMATE CHANGE AND VARIABILITY			
RAINFALL VARIABILITY			
3.1	<p>In comparison to when you first lived here and in the recent past (last 5 – 10 years), have you observed any variations in the rainfall?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.27!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.2	How long ago did you start experiencing variations in rainfall?	<input type="checkbox"/> 1. Last 2 years <input type="checkbox"/> 2. Last 5 years <input type="checkbox"/> 3. Last 10 years <input type="checkbox"/> 4. Last 20 years <input type="checkbox"/> 5. More than 20 years ago <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, please specify _____ <input type="checkbox"/> 8. N/A	
3.3	<p>Is the observed variation of increased rainfall?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.11!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.4	Which periods (state months and possibly years of extreme rainfall).	Year	Month

3.5	<p>Is the increase of rainfall beneficial to your household's wellbeing?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.7!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
3.6	<p>How beneficial is the increase in rainfall to your household's wellbeing?</p>	<input type="checkbox"/> 1. It means our crops can grow well <input type="checkbox"/> 2. We know when to expect rains and start cultivating <input type="checkbox"/> 3. It means we have a lot of water for domestic use and stock watering <input type="checkbox"/> 4. It means more fishing activities for us <input type="checkbox"/> 5. I don't know <input type="checkbox"/> 6. Other, <i>please specify</i> _____ <input type="checkbox"/> 7. N/A <p><i>Tick more than one option if applicable!</i></p>
3.7	<p>Is the increase of rainfall problematic to your household's wellbeing?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.11!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
3.8	<p>In what way is the increase in rainfall problematic to your household's wellbeing?</p>	<input type="checkbox"/> 1. It means our cassava will rot before we harvest <input type="checkbox"/> 2. It means our crops will get submerged in water <input type="checkbox"/> 3. We are prone to losing our property due to flooding <input type="checkbox"/> 4. It means less fishing activities for us <input type="checkbox"/> 5. Difficult to determine the rainfall patterns for cultivation <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, <i>please specify</i> _____ <input type="checkbox"/> 8. N/A <p><i>Tick more than one option if applicable!</i></p>
3.9	<p>If the increase in rainfall patterns is problematic for your household's wellbeing, what have you done as a household to respond to the problem of increased rainfall?</p>	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand too much water <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home to drier land <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. Stored more food for when we fail to produce enough <input type="checkbox"/> 12. I don't know <input type="checkbox"/> 13. Other, <i>please specify</i> _____ <input type="checkbox"/> 14. N/A <p><i>Tick more than one option if applicable!</i></p>

3.10	What challenges have you experienced in responding to the problem of increased rainfall?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Failure to gain income from fishing activities <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of profitable alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, please specify _____ <input type="checkbox"/> 12. N/A <i>Tick more than one option if applicable!</i>								
3.11	Is the observed variation of decreased rainfall patterns? <i>If your answer is option 2 or 3, proceed to question 3.19!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know								
3.12	Which periods (state months and possibly years of decreased rainfall).	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Year</th> <th style="width: 50%; text-align: center;">Month</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> </tbody> </table>	Year	Month						
Year	Month									
3.13	Is the decrease of rainfall beneficial to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.15!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A								
3.14	How beneficial is the decreases in rainfall patterns to your household's wellbeing	<input type="checkbox"/> 1. It means our crops can grow well <input type="checkbox"/> 2. It means our crops can not get submerged in water <input type="checkbox"/> 3. It means we are less prone to flooding <input type="checkbox"/> 4. It means more fishing activities for us <input type="checkbox"/> 5. It means we know when to start cultivating <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, please specify _____ <input type="checkbox"/> 7. N/A <i>Tick more than one option if applicable!</i>								
3.15	Is the decrease in rainfall patterns problematic to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.19!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know								
3.16	In what way is the decrease in rainfall patterns problematic	<input type="checkbox"/> 1. Our cassava will rot before we harvest <input type="checkbox"/> 2. Our crops fail to mature								

	to your household's wellbeing?	<input type="checkbox"/> 3. We do not have a lot of water for domestic use and stock watering <input type="checkbox"/> 4. It means less fishing activities for us <input type="checkbox"/> 5. Prone to wildlife attacks because they move to our home dwellings in search of water <input type="checkbox"/> 6. Not sure when to expect rains and start cultivating <input type="checkbox"/> 7. I don't know <input type="checkbox"/> 8. Other, <i>please specify</i> _____ <input type="checkbox"/> 9. N/A <i>Tick more than one option if applicable!</i>
3.17	If the decrease in rainfall patterns is problematic to your household's well being, what have you done as a household to respond to the problem of decreased rainfall?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand less rain <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <i>Tick more than one option if applicable!</i>
3.18	What challenges have you experienced in responding to the problem of decreased rainfall?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Little earning from fishing activities <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of profitable alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, <i>please specify</i> _____ <input type="checkbox"/> 12. N/A <i>Tick more than one option if applicable!</i>
3.19	Is the observed variation of unpredictable rainfall – <i>Hard to tell whether the season would have enough or too little rain for farming purposes?</i> <i>If your answer is option 2 or 3, proceed to question 3.27!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know

		Year	Month
3.20	Which periods (state months and possibly years of extreme unpredictable rainfall).		
3.21	Is the unpredictability of rainfall (<i>When it is hard to tell whether the season would have enough or too little rain for farming purposes</i>) beneficial to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.23!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A	
3.22	How beneficial is the unpredictability of the rainfall situation?	<input type="checkbox"/> 1. It means our food crop can grow well <input type="checkbox"/> 2. It means we have better chances of reaping farm produce <input type="checkbox"/> 3. It means we are less prone to flooding <input type="checkbox"/> 4. It means we are less prone to drought <input type="checkbox"/> 5. It means more fishing activities for us <input type="checkbox"/> 6. It means we know when to expect rains and start cultivating <input type="checkbox"/> 7. I don't know <input type="checkbox"/> 8. Other, <i>please specify</i> _____ <input type="checkbox"/> 9. N/A <input type="checkbox"/> <i>Tick more than one option if applicable!</i>	
3.23	Is the unpredictability of rainfall (<i>Hard to tell whether the season would have enough or too little rain for farming purposes</i>) problematic to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.27!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A	
3.24	In what way is the unpredictability of rainfall problematic to your household's wellbeing?	<input type="checkbox"/> 1. Not sure when to expect rains and start farming <input type="checkbox"/> 2. Our cassava will rot before we harvest <input type="checkbox"/> 3. Our crops fail to mature <input type="checkbox"/> 4. We do not have a lot of water for domestic use and stock watering <input type="checkbox"/> 5. It means less fishing activities for us <input type="checkbox"/> 6. Prone to wildlife attacks because they move to our homesteads <input type="checkbox"/> 7. I don't know <input type="checkbox"/> 8. Other, <i>please specify</i> _____ <input type="checkbox"/> 9. N/A <i>Tick more than one option if applicable!</i>	

3.25	If the unpredictability of the rainfall is problematic to your household's wellbeing (<i>hard to tell whether the season would have enough or too little rain for farming purposes</i>), what have you done as a household to respond to the problem of unpredictable rainfall?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand any form of conditions <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <i>Tick more than one option if applicable!</i>
3.26	What challenges have you experienced in responding to the problem of unpredictable rainfall?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Little income realised from fishing <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of profitable alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, <i>please specify</i> _____ <input type="checkbox"/> 12. N/A
DRY SPELLS OR DRYING CONDITIONS		
3.27	In comparison to when you first lived here and in the recent past (last 5 – 10 years), have you observed any variations in the pattern of dry spells? <i>If your answer is option 2 or 3, proceed to question 3.37!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know
3.28	How long ago did you start experiencing variations in drying conditions or dry spells in the area?	<input type="checkbox"/> 1. Last 2 years <input type="checkbox"/> 2. Last 5 years <input type="checkbox"/> 3. Last 10 years <input type="checkbox"/> 4. Last 20 years <input type="checkbox"/> 5. More than 20 years ago <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, <i>please specify</i> _____ <input type="checkbox"/> 8. N/A

3.29	<p>Is the observed variation of increased drying conditions or dry spells?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.37!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A	
3.30	<p>If area experiences drying conditions or dry spells which periods (state months and possibly years of extreme dry spells).</p>	Year	Month
3.31	<p>Is the increase in drying conditions or dry spells beneficial to your household's wellbeing?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.33!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.32	<p>How beneficial is the increase in drying conditions or dry spells?</p>	<input type="checkbox"/> 1. It means our food crop can grow well <input type="checkbox"/> 2. It means we have a lot of water for domestic use and stock watering <input type="checkbox"/> 3. It means more fishing activities for us <input type="checkbox"/> 4. It means we are less prone to flooding <input type="checkbox"/> 5. It means we can properly plan for farming <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, <i>please specify</i> _____ <input type="checkbox"/> 8. N/A <i>Tick more than one option if applicable!</i>	
3.33	<p>Is the increase in drying conditions problematic to your household's wellbeing?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.37!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.34	<p>In what way is the increase in drying conditions or dry spells problematic to your household's wellbeing?</p>	<input type="checkbox"/> 1. Crop failure <input type="checkbox"/> 2. We don't have enough food during the year <input type="checkbox"/> 3. Our sources of water dry out <input type="checkbox"/> 4. Increased conflicts in accessing water at public sources <input type="checkbox"/> 5. Walk longer distances in search of water <input type="checkbox"/> 6. Human-wildlife conflicts <input type="checkbox"/> 7. I don't know <input type="checkbox"/> 8. Other, <i>please specify</i> _____ <i>Tick more than one option if applicable!</i>	

3.35	If the increase in drying conditions or dry spells is problematic to your household's wellbeing, what have you done as a household to respond to the problem of increased drying conditions?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand dry conditions <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <i>Tick more than one option if applicable!</i>	
3.36	What challenges have you experienced in responding to the problem of increased drying conditions?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Banned from fishing <input type="checkbox"/> 3. Little earning from fishing activities <input type="checkbox"/> 4. Lack of income to boost our businesses <input type="checkbox"/> 5. Banned from charcoal burning <input type="checkbox"/> 6. Lack of inputs <input type="checkbox"/> 7. Lack of alternative livelihood activities <input type="checkbox"/> 8. Earned low incomes from day labour <input type="checkbox"/> 9. Failure to find suitable land for cultivation <input type="checkbox"/> 10. Failure to find suitable land for relocation <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A	
TEMPERATURE VARIABILITY			
3.37	<p>Since, you first lived here, have you observed any variations on the temperature pattern year after year?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.57!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.38	How long ago did the area start experiencing variations in temperature?	<input type="checkbox"/> 1. Last 2 years <input type="checkbox"/> 2. Last 5 years <input type="checkbox"/> 3. Last 10 years <input type="checkbox"/> 4. Last 20 years <input type="checkbox"/> 5. More than 20 years ago	
3.39	<p>Is the variation you observed of increased temperature?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.48!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A	
3.40		Year	Month

	If area experiences temperature increases, which periods (state months and possibly years of extreme temperatures).		
3.41	How can you tell whether the temperature has increased?	<input type="checkbox"/> 1. Drying out of rivers <input type="checkbox"/> 2. Drying out of domestic water sources <input type="checkbox"/> 3. Animals moving closer to homesteads because open sources dry out in the park <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, <i>please specify</i> _____	<p><i>Tick more than one option if applicable!</i></p>
3.42	Is the increase in temperature beneficial to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.44!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A	
3.43	How beneficial is the increase in temperature conditions to your household's well being?	<input type="checkbox"/> 1. We are not prone to hypothermia <input type="checkbox"/> 2. We are not prone to pneumonia <input type="checkbox"/> 3. Some crops do well in hot temperatures <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, <i>please specify</i> _____ <input type="checkbox"/> 6. N/A	
3.44	Is the increase in temperature conditions problematic to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.48!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.45	In what way is the increase in temperature conditions problematic to your household's wellbeing?	<input type="checkbox"/> 1. Less access to water <input type="checkbox"/> 2. Too much competition for water with wildlife <input type="checkbox"/> 3. We are prone to animal attack as we look for water <input type="checkbox"/> 4. Food crops failing to mature <input type="checkbox"/> 5. I don't know <input type="checkbox"/> 6. Other, <i>please specify</i> _____	
3.46	If the increase in temperature conditions problematic to your household's wellbeing, what have you done as a household to respond to the problem of increased temperature?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand hot temperatures <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know	

		<input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <i>Tick more than one option if applicable!</i>	
3.47	What challenges have you experienced in responding to the problem of increased temperature conditions?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Banned from fishing <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, <i>please specify</i> _____ <input type="checkbox"/> 12. N/A <i>Tick more than one option if applicable!</i>	
3.48	Is the variation you observed of decreased temperature? <i>If your answer is option 2 or 3, proceed to question 3.57!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.49	If area experiences temperature decreases, which periods (state months and possibly years of extreme decreased temperatures).	Year	Month
3.50	How can you tell whether the temperature has decreased?	<input type="checkbox"/> 1. Much colder temperatures than before <input type="checkbox"/> 2. Now experience snow flakes in winter <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. Other, <i>please specify</i> _____ <i>Tick more than one option if applicable!</i>	
3.51	Is the decrease in temperature beneficial to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.53!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know	
3.52	How beneficial is the decrease in temperature conditions to your household's well being?	<input type="checkbox"/> 1. Less occurrence of drying up rivers <input type="checkbox"/> 2. Crops do well in decreased temperatures <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. Other, <i>please specify</i> _____ <input type="checkbox"/> 5. N/A	

3.53	<p>Is the decrease in temperature conditions problematic to your household's wellbeing?</p> <p><i>If your answer is option 2 or 3, proceed to question 3.57!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know
3.54	<p>In what way is the decrease in temperature conditions problematic to your household's wellbeing?</p>	<input type="checkbox"/> 1. Crop failure due to frost <input type="checkbox"/> 2. Children prone to pneumonia <input type="checkbox"/> 3. We are prone to hypothermia <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, <i>please specify</i> _____
3.55	<p>If the decrease in temperature patterns is problematic to your household's wellbeing, what have you done as a household to respond to the problem of decreased temperature?</p>	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand reduced temperature conditions <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <p><i>Tick more than one option if applicable!</i></p>
3.56	<p>What challenges have you experienced in responding to the problem of decreased temperature?</p>	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Banned from fishing <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, <i>please specify</i> _____ <input type="checkbox"/> 12. N/A <p><i>Tick more than one option if applicable!</i></p>
FLOODING AND IT'S IMPLICATIONS ON LIVELIHOOD		
3.57	<p>Do you experience floods in this area?</p> <p><i>If the answer is option 2 or 3, proceed to question 4.1!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. Other, <i>please specify</i> _____

3.58	What do you think is the cause for the floods in this area?	<input type="checkbox"/> 1. Too much rainfall <input type="checkbox"/> 2. Bursting of local rivers <input type="checkbox"/> 3. Water movement from upper lands <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, <i>please specify</i> _____ <input type="checkbox"/> N/A <i>Tick more than one option if applicable!</i>								
3.59	If area gets flooded, which periods (state months and possibly years of extreme flooding.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Year</th> <th style="width: 50%; text-align: center;">Month</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> </tbody> </table>	Year	Month						
Year	Month									
3.60	How long ago did the area start getting flooded?	<input type="checkbox"/> 1. Last 2 years <input type="checkbox"/> 2. Last 5 years <input type="checkbox"/> 3. Last 10 years <input type="checkbox"/> 4. Last 20 years <input type="checkbox"/> 5. More than 20 years ago								
3.61	Is the flooding beneficial to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 3.63!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know								
3.62	What kinds of benefits does your household derive from the floods?	<input type="checkbox"/> 1. Grow crops that do well in water logged conditions <input type="checkbox"/> 2. Our stock have sufficient grazing pasture <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. Other, <i>please specify</i> _____ <input type="checkbox"/> 5. N/A <i>Tick more than one option if applicable!</i>								
3.63	Is the flooding problematic to your household's wellbeing? <i>If your answer is option 2 or 3, proceed to question 4.1!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know								
3.64	In what way are the flood occurrences problematic to your household's wellbeing?	<input type="checkbox"/> 1. Displacement from home <input type="checkbox"/> 2. Loss of property and livestock <input type="checkbox"/> 3. Loss of crops <input type="checkbox"/> 4. Loss of arable land <input type="checkbox"/> 5. We don't have enough food during the year <input type="checkbox"/> 6. We get cut off from civilisation <input type="checkbox"/> 7. Damage to infrastructure <input type="checkbox"/> 8. I don't know <input type="checkbox"/> 9. Other, <i>please specify</i> _____ <input type="checkbox"/> 10. N/A <i>Tick more than one option if applicable!</i>								

3.65	If floods are problematic to your household's wellbeing, what have you done as a household to respond to the problem of increased drying conditions?	<input type="checkbox"/> 1. Nothing <input type="checkbox"/> 2. Changed types of crops grown to those that can withstand too much water <input type="checkbox"/> 3. Stopped cultivating <input type="checkbox"/> 4. Opted to burn charcoal for a living <input type="checkbox"/> 5. Opted to keep bees for a living <input type="checkbox"/> 6. Opted to sell livestock to survive <input type="checkbox"/> 7. Opted to sell fish for a living <input type="checkbox"/> 8. Migrated from our home <input type="checkbox"/> 9. Engaged in small businesses <input type="checkbox"/> 10. Started doing day labour to survive <input type="checkbox"/> 11. I don't know <input type="checkbox"/> 12. Other, <i>please specify</i> _____ <input type="checkbox"/> 13. N/A <i>Tick more than one option if applicable!</i>
3.66	What challenges have you experienced in responding to the problem of floods?	<input type="checkbox"/> 1. Lack of support from government/NGOs (Extension work) <input type="checkbox"/> 2. Banned from fishing <input type="checkbox"/> 3. Lack of income to boost our businesses <input type="checkbox"/> 4. Banned from charcoal burning <input type="checkbox"/> 5. Lack of inputs <input type="checkbox"/> 6. Lack of alternative livelihood activities <input type="checkbox"/> 7. Earned low incomes from day labour <input type="checkbox"/> 8. Failure to find suitable land for cultivation <input type="checkbox"/> 9. Failure to find suitable land for relocation <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. Other, please specify _____ <input type="checkbox"/> 12. N/A
SECTION IV: INSTITUTIONAL SUPPORT TO CLIMATE CHANGE /VARIATION AND COMMUNITY ORGANISATION		
INSTITUTIONAL SUPPORT TO LOCAL CLIMATE CHANGE ADAPTATION		
4.1	Does/did your household get assistance from the government or NGOs when crops fail as a result of drought? <i>If your answer is option 2, proceed to question 4.3!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.2	If your answer is option 1, what kind of assistance do/did you get?	<input type="checkbox"/> 1. Food packages <input type="checkbox"/> 2. Financial support <input type="checkbox"/> 3. Crop input (seed and fertilizer) <input type="checkbox"/> 4. Advice on coping measures <input type="checkbox"/> 5. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 6. Advice on fertilizer use <input type="checkbox"/> 7. Advice on manure use

		<input type="checkbox"/> 8. Advice on winter cropping <input type="checkbox"/> 9. Advice to cultivate in lower or dump areas in drought years <input type="checkbox"/> 10. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 11. Support to livestock restocking programme <input type="checkbox"/> 12. Advice or support to bee keeping <input type="checkbox"/> 13. I don't know <input type="checkbox"/> 14. Other, <i>please specify</i> _____ <input type="checkbox"/> 15. N/A <i>Tick more than one option if applicable!</i>
4.3	<p>Does/did your household get assistance from the government or NGOs when crops fail as a result of floods?</p> <p><i>If your answer is option 2, proceed to question 4.5!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.4	<p>What kind of assistance do/did you get?</p>	<input type="checkbox"/> 1. Relocation to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Financial support <input type="checkbox"/> 4. Crop input (seed and fertilizer) <input type="checkbox"/> 5. Advice on coping measures <input type="checkbox"/> 6. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 7. Advice on fertilizer use <input type="checkbox"/> 8. Advice on manure use <input type="checkbox"/> 9. Advice on winter cropping <input type="checkbox"/> 10. Advice on stock/manure use in fields <input type="checkbox"/> 11. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 12. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 13. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 14. Support to livestock restocking programme <input type="checkbox"/> 15. Advice or support to bee keeping <input type="checkbox"/> 15. I don't know <input type="checkbox"/> 16. Other, <i>please specify</i> _____ <input type="checkbox"/> 17. N/A <i>Tick more than one option if applicable!</i>
4.5	<p>Does/did your household get assistance from the government or NGOs when your household got flooded?</p> <p><i>If your answer is option 2, proceed to question 4.7!</i></p>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A

4.6	If your answer is option 1 in question 4.5, what kind of assistance do/did you get?	<input type="checkbox"/> 1. Relocation to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Financial support <input type="checkbox"/> 4. Crop input (seed and fertilizer) <input type="checkbox"/> 5. Advice on coping measures <input type="checkbox"/> 6. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 7. Advice on fertilizer use <input type="checkbox"/> 8. Advice on manure use <input type="checkbox"/> 9. Advice on winter cropping <input type="checkbox"/> 10. Advice on stock/manure use in fields <input type="checkbox"/> 11. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 12. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 13. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 14. Support to livestock restocking programme <input type="checkbox"/> 15. Advice or support to bee keeping <input type="checkbox"/> 16. I don't know <input type="checkbox"/> 17. Other, <i>please specify</i> _____ <input type="checkbox"/> 18. N/A <input type="checkbox"/> Tick more than one option if applicable!
4.7	<p><i>Only ask the following questions if ever gotten assistance from institutions whether during floods or droughts!</i> <i>Otherwise, proceed to question 4.44!</i></p> <p>Which organisations help(ed) you with this support?</p>	<input type="checkbox"/> 1. Local government <input type="checkbox"/> 2. Technical officers <input type="checkbox"/> 3. Local NGOs <input type="checkbox"/> 4. Civil Society <input type="checkbox"/> 5. Traditional leadership <input type="checkbox"/> 6. I don't know <input type="checkbox"/> 7. Other, <i>please specify</i> _____ <input type="checkbox"/> 8. N/A Tick more than one option if applicable!
4.8	If the answer is option 1 (local government), was their support relevant to meet your household needs?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.9	If your answer is option 1 (yes), explain how their support was relevant to meet your household needs?	<hr/> <hr/>
4.10	If your answer is option 2 (no), explain why their support was not relevant to meet your household needs?	<hr/> <hr/>
4.11	Was the support in line with what you do to deal with climatic hazards? (Did it fit	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A

	well with your coping strategies?) <i>If your answer is option 2, proceed to question 4.13!</i>	
4.12	Why do you say the support was in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, we practice conservation agriculture just as they recommended <input type="checkbox"/> 2. Because, we practice winter cropping just as they recommended <input type="checkbox"/> 3. Because we practice crop rotation, just as they recommended <input type="checkbox"/> 4. Because, we diversify in livelihood alternatives, just as they recommended <input type="checkbox"/> 5. Because, we store food in time of surplus for times of shortages just as they recommended <input type="checkbox"/> 6. Because we relocate to drier grounds just as they suggested <input type="checkbox"/> 7. Because we harvest rain water just as they recommended <input type="checkbox"/> 8. Because we now rear small livestock just as they recommended <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A <i>Tick more than one option if applicable!</i>
4.13	Why do you say the support was not in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, they said we should practice conservation agriculture which is new to us <input type="checkbox"/> 2. Because, they said we should practice winter cropping which is new to us <input type="checkbox"/> 3. Because they said we practice crop rotation, which is new to us <input type="checkbox"/> 4. Because, they said we diversify in livelihood alternatives, which is new to us <input type="checkbox"/> 5. Because, they said we store food in time of surplus for use in times of shortages which is new to us <input type="checkbox"/> 6. Because they said we relocate to drier grounds which is new to us <input type="checkbox"/> 7. Because they said we should harvest rain water for use in dry years which is new to us <input type="checkbox"/> 8. Because they said we should now rear small livestock which is new to us <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A
4.14	Is there anything you think could be/have been done better to improve on the support they rendered to you? <i>If your answer is option 2, 3 and 4, proceed to question 4.16!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A

4.15	If answer to question 4.14 is option 1(yes) , what could have been done better to improve on the support they rendered?	<hr/> <hr/>
4.16	Of the institutional support received, rank the first three most important supports to your adaptation and those which you are in most need of?	<input type="checkbox"/> 1. Relocated to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Shelter <input type="checkbox"/> 4. Financial support <input type="checkbox"/> 5. Crop input (seed and fertilizer) <input type="checkbox"/> 6. Advice on coping measures <input type="checkbox"/> 7. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 8. Advice on fertilizer use <input type="checkbox"/> 9. Advice on manure use <input type="checkbox"/> 10. Advice on winter cropping <input type="checkbox"/> 11. Advice on stock/manure use in fields <input type="checkbox"/> 12. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 13. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 14. Advice to cultivate in lower or dump areas in drought years <input type="checkbox"/> 15. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 16. Support to livestock restocking programme <input type="checkbox"/> 17. Advice or support to bee keeping <input type="checkbox"/> 18. I don't know <input type="checkbox"/> 19. Other, <i>please specify</i> _____ <input type="checkbox"/> 20. N/A
4.17	If the answer is option 2 (technical officers), was their support relevant to meet your household needs?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.18	If your answer is option 1 (yes) , explain how their support was relevant to meet your household needs?	<hr/> <hr/>
4.19	If your answer is option 2 (no) , explain why their support was not relevant to meet your household needs?	<hr/> <hr/>
4.20	Was the support in line with what you do to deal with climatic hazards? (Did it fit well with your coping strategies?) <i>If your answer is option 2, proceed to question 4.22!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A

4.21	Why do you say the support was in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, we practice conservation agriculture just as they recommended <input type="checkbox"/> 2. Because, we practice winter cropping just as they recommended <input type="checkbox"/> 3. Because we practice crop rotation, just as they recommended <input type="checkbox"/> 4. Because, we diversify in livelihood alternatives, just as they recommended <input type="checkbox"/> 5. Because, we store food in time of surplus for times of shortages just as they recommended <input type="checkbox"/> 6. Because we relocate to drier grounds just as they suggested <input type="checkbox"/> 7. Because we harvest rain water just as they recommended <input type="checkbox"/> 8. Because we now rear small livestock just as they recommended <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A <i>Tick more than one option if applicable!</i>
4.22	Why do you say the support was not in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, they said we should practice conservation agriculture which is new to us <input type="checkbox"/> 2. Because, they said we should practice winter cropping which is new to us <input type="checkbox"/> 3. Because they said we practice crop rotation, which is new to us <input type="checkbox"/> 4. Because, they said we diversify in livelihood alternatives, which is new to us <input type="checkbox"/> 5. Because, they said we store food in time of surplus for use in times of shortages which is new to us <input type="checkbox"/> 6. Because they said we relocate to drier grounds which is new to us <input type="checkbox"/> 7. Because they said we should harvest rain water for use in dry years which is new to us <input type="checkbox"/> 8. Because they said we should now rear small livestock which is new to us <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A
4.23	Is there anything you think could be/have been done better to improve on their institutional support? <i>If your answer is option 2, 3 and 4, proceed to question 4.25!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.24	If answer to question 4.23 is option 1(yes) , what could have been done better to improve on the support they rendered?	<hr/> <hr/>

4.25	Of the institutional support received, rank the first three most important supports to your adaptation and those which you are in most need of?	<input type="checkbox"/> 1. Relocated to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Shelter <input type="checkbox"/> 4. Financial support <input type="checkbox"/> 5. Crop input (seed and fertilizer) <input type="checkbox"/> 6. Advice on coping measures <input type="checkbox"/> 7. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 8. Advice on fertilizer use <input type="checkbox"/> 9. Advice on manure use <input type="checkbox"/> 10. Advice on winter cropping <input type="checkbox"/> 11. Advice on stock/manure use in fields <input type="checkbox"/> 12. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 13. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 14. Advice to cultivate in lower or dump areas in drought years <input type="checkbox"/> 15. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 16. Support to livestock restocking programme <input type="checkbox"/> 17. Advise or support to bee keeping <input type="checkbox"/> 18. I don't know <input type="checkbox"/> 19. Other, <i>please specify</i> _____ <input type="checkbox"/> 20. N/A
4.26	If the answer is option 3 and 4 NGOs and Civil Society , was their support relevant to meet your household needs?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.27	If your answer is option 1 (yes) , explain how their support was relevant to meet your household needs?	<hr/> <hr/>
4.28	If your answer is option 2 (no) , explain why their support was not relevant to meet your household needs?	<hr/> <hr/>
4.29	Was the support in line with what you do to deal with climatic hazards? (Did it fit well with your coping strategies?) <i>If your answer is option 2, proceed to question 4.31!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.30	Why do you say the support was in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, we practice conservation agriculture just as they recommended <input type="checkbox"/> 2. Because, we practice winter cropping just as they recommended <input type="checkbox"/> 3. Because we practice crop rotation, just as they recommended

		<input type="checkbox"/> 4. Because, we diversify in livelihood alternatives, just as they recommended <input type="checkbox"/> 5. Because, we store food in time of surplus for times of shortages just as they recommended <input type="checkbox"/> 6. Because we relocate to drier grounds just as they suggested <input type="checkbox"/> 7. Because we harvest rain water just as they recommended <input type="checkbox"/> 8. Because we now rear small livestock just as they recommended <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A <i>Tick more than one option if applicable!</i>
4.31	Why do you say the support was not in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, they said we should practice conservation agriculture which is new to us <input type="checkbox"/> 2. Because, they said we should practice winter cropping which is new to us <input type="checkbox"/> 3. Because they said we practice crop rotation, which is new to us <input type="checkbox"/> 4. Because, they said we diversify in livelihood alternatives, which is new to us <input type="checkbox"/> 5. Because, they said we store food in time of surplus for use in times of shortages which is new to us <input type="checkbox"/> 6. Because they said we relocate to drier grounds which is new to us <input type="checkbox"/> 7. Because they said we should harvest rain water for use in dry years which is new to us <input type="checkbox"/> 8. Because they said we should now rear small livestock which is new to us <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A <input type="checkbox"/>
4.32	Is there anything you think could be/have been done better to improve on their institutional support? <i>If your answer is option 2, 3 and 4, proceed to question 4.34!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.33	If answer to question 4.32 is option 1(yes) , what could have been done better to improve on the support they rendered?	<hr/> <hr/>
4.34	Of the institutional support received, rank the first three most important supports to your adaptation and those	<input type="checkbox"/> 1. Relocated to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Shelter <input type="checkbox"/> 4. Financial support <input type="checkbox"/> 5. Crop input (seed and fertilizer)

	which you are in most need of?	<input type="checkbox"/> 6. Advice on coping measures <input type="checkbox"/> 7. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 8. Advice on fertilizer use <input type="checkbox"/> 9. Advice on manure use <input type="checkbox"/> 10. Advice on winter cropping <input type="checkbox"/> 11. Advice on stock/manure use in fields <input type="checkbox"/> 12. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 13. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 14. Advice to cultivate in lower or dump areas in drought years <input type="checkbox"/> 15. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 16. Support to livestock restocking programme <input type="checkbox"/> 17. I don't know <input type="checkbox"/> 18. Other, <i>please specify</i> _____ <input type="checkbox"/> 19. N/A
4.35	If the answer is option 5 (traditional leadership), was their support relevant to meet your household needs?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.36	If your answer is option 1 (yes), explain how their support was relevant to meet your household needs?	<hr/> <hr/>
4.37	If your answer is option 2 (no), explain why their support was not relevant to meet your household needs?	<hr/> <hr/>
4.38	Was the support in line with what you do to deal with climatic hazards? (Did it fit well with your coping strategies?) <i>If your answer is option 2, proceed to question 4.40!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.39	Why do you say the support was in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, we practice conservation agriculture just as they recommended <input type="checkbox"/> 2. Because, we practice winter cropping just as they recommended <input type="checkbox"/> 3. Because we practice crop rotation, just as they recommended <input type="checkbox"/> 4. Because, we diversify in livelihood alternatives, just as they recommended <input type="checkbox"/> 5. Because, we store food in time of surplus for times of shortages just as they recommended <input type="checkbox"/> 6. Because we relocate to drier grounds just as they suggested

		<input type="checkbox"/> 7. Because we harvest rain water just as they recommended <input type="checkbox"/> 8. Because we now rear small livestock just as they recommended <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A <i>Tick more than one option if applicable!</i>
4.40	Why do you say the support was not in line with what you do to respond to climatic hazards?	<input type="checkbox"/> 1. Because, they said we should practice conservation agriculture which is new to us <input type="checkbox"/> 2. Because, they said we should practice winter cropping which is new to us <input type="checkbox"/> 3. Because they said we practice crop rotation, which is new to us <input type="checkbox"/> 4. Because, they said we diversify in livelihood alternatives, which is new to us <input type="checkbox"/> 5. Because, they said we store food in time of surplus for use in times of shortages which is new to us <input type="checkbox"/> 6. Because they said we relocate to drier grounds which is new to us <input type="checkbox"/> 7. Because they said we should harvest rain water for use in dry years which is new to us <input type="checkbox"/> 8. Because they said we should now rear small livestock which is new to us <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. I don't know <input type="checkbox"/> 11. N/A
4.41	Is there anything you think could be/have been done better to improve on their institutional support? <i>If your answer is option 2, 3 and 4, proceed to question 4.43!</i>	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.42	If answer to question 4.41 is option 1(yes) , what could have been done better to improve on the support they rendered?	<hr/> <hr/>
4.43	Of the institutional support received, rank the first three most important supports to your adaptation and those which you are in most need of?	<input type="checkbox"/> 1. Relocated to drier lands <input type="checkbox"/> 2. Food packages <input type="checkbox"/> 3. Shelter <input type="checkbox"/> 4. Financial support <input type="checkbox"/> 5. Crop input (seed and fertilizer) <input type="checkbox"/> 6. Advice on coping measures <input type="checkbox"/> 7. Advice on farming methods (e.g. conservation agriculture) <input type="checkbox"/> 8. Advice on fertilizer use <input type="checkbox"/> 9. Advice on manure use <input type="checkbox"/> 10. Advice on winter cropping

		<input type="checkbox"/> 11. Advice on stock/manure use in fields <input type="checkbox"/> 12. Advice to cultivate on higher grounds during floods <input type="checkbox"/> 13. Advice to cultivate in flooded areas for crops like rice <input type="checkbox"/> 14. Advice to cultivate in lower or dump areas in drought years <input type="checkbox"/> 15. Advice on cultivating away from wildlife corridors <input type="checkbox"/> 16. Support to livestock restocking programme <input type="checkbox"/> 17. I don't know <input type="checkbox"/> 18. Other, <i>please specify</i> _____ <input type="checkbox"/> 19. N/A
COMMUNITY ORGANISATIONS IN RESPONSE TO CLIMATE CHANGE AND INSTITUTIONAL SUPPORT		
4.44	When responding to the problem of floods and droughts, is/was there a time when the community came together to form community based groups to try and resolve these problems?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.45	How do/did the community decide who should be part of the group?	<input type="checkbox"/> 1. There was no decision, everybody had to participate <input type="checkbox"/> 2. Only community leaders were/are in these groups <input type="checkbox"/> 3. Looked for people that are out spoken <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 6. Other, please specify _____ <input type="checkbox"/> 5. N/A <i>Tick more than one option if applicable!</i>
4.46	What kind(s) of activities are/is undertaken in these groups?	<input type="checkbox"/> 1. Meetings <input type="checkbox"/> 2. Awareness creation on good fishing methods <input type="checkbox"/> 3. Awareness creation on conservation farming methods <input type="checkbox"/> 4. Awareness creation on importance of preserving trees and the environment <input type="checkbox"/> 5. Capacity building activities on farming methods <input type="checkbox"/> 6. Dialogue with institutions on matters affecting communities <input type="checkbox"/> 7. I don't know <input type="checkbox"/> 8. Other, please specify _____ <input type="checkbox"/> 8. N/A <i>Tick more than one option if applicable!</i>
4.47	How do group members ensure that everybody involved in these groups participates?	<input type="checkbox"/> 1. By giving different tasks to different people <input type="checkbox"/> 2. By involving only those that are outspoken <input type="checkbox"/> 3. By evaluative meetings <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, please specify _____

		<input type="checkbox"/> 6. N/A
4.48	If the groups are in existence, how are the groups currently working in response to the problems the community is facing?	<input type="checkbox"/> 1. Working well because they are creating awareness in the community <input type="checkbox"/> 2. Working well because they are stopping people from cutting down trees <input type="checkbox"/> 3. Working well because they monitor fishing methods used <input type="checkbox"/> 4. Working well because they are building capacity on farming methods <input type="checkbox"/> 5. Not working well because they are not creating awareness in the community <input type="checkbox"/> 6. Not working well because they are not stopping people from cutting down trees <input type="checkbox"/> 7. Not working well because they don't monitor bad fishing methods used <input type="checkbox"/> 8. Not working well because they are not building capacity on farming methods <input type="checkbox"/> 9. Other, please specify _____ <input type="checkbox"/> 10. N/A
4.49	When seeking support from institutions (in times of drought or floods), is there a procedure used to solicit for support?	<input type="checkbox"/> 1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> 3. I don't know <input type="checkbox"/> 4. N/A
4.50	If yes, how do you solicit for support?	<input type="checkbox"/> 1. No soliciting done <input type="checkbox"/> 2. Headman/chief/community leader reports problems to the District Office <input type="checkbox"/> 3. Anybody can report to the District Office <input type="checkbox"/> 4. Wait for them to find out what is happening in community <input type="checkbox"/> 5. I don't know <input type="checkbox"/> 6. Other, please specify _____ <input type="checkbox"/> 7. N/A
4.51	If there is a specific person in charge mobilizing the community to solicit the support, how was this person chosen to be the one soliciting for support?	<input type="checkbox"/> 1. Self appointment <input type="checkbox"/> 2. Community meetings <input type="checkbox"/> 3. Because they are a community leader <input type="checkbox"/> 4. I don't know <input type="checkbox"/> 5. Other, please specify _____ <input type="checkbox"/> 6. N/A
ENDING THE INTERVIEW		
<p>The interview is almost over – but if there is something you would like to mention, which is important to you, please do so:</p> <p>_____</p>		
<p>Thank you very much for your time and cooperation – you have been most helpful.</p>		
Time of finishing the interview:		

Duration of interview:	_____ minutes
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APPENDIX 12: INTERVIEW GUIDE USED FOR THE FOCUSED GROUP DISCUSSIONS

FOCUS GROUP DISCUSSION GUIDE

For structured interviews

Province: _____
District: _____
Ward: _____
Village/settlement: _____
Date: _____

Explain importance of the FDG: We have come to ask some questions regarding climate variations and changes (i.e. floods & droughts) and how institutions (i.e. the government and NGOs) in the area have assisted the communities to adapt. The information required is for academic purposes and we would like to ask you to participate in this group interview about community experiences on issues of climate change. There are no wrong answers to the questions that will be asked. Please answer all questions truthfully and if you feel there is need for further clarifications, please do let us know.

Please note that there is no direct benefit to you in participating to this study, but it is a way of helping us understand the climate change situation in this area. Do you have any questions for us? You may ask questions about this study at any time.

CLIMATE CHANGE IN THE STUDY AREA	QUESTIONS
Floods	<ul style="list-style-type: none"> • Do you experience floods in this area? • When did you start observing the floods? Any examples of particular years within which your community experienced severe flooding in the last 10 or 20 years? <i>Other examples can be extreme floods, but also everyday local events e.g. small local floods etc.</i> • What do you think is the cause of floods? • What are the impacts of floods on local livelihood?
Community Response to Floods	<ul style="list-style-type: none"> • What do you do as a community or at household level, when resolving the problem of floods? • When responding to the problem of floods, is/was there a time when the community came together to form community based groups to try and resolve these problems? • How do/did the community decide who should be part of the group? • What kind(s) of activities are/is undertaken in these groups?

	<ul style="list-style-type: none"> • If the groups are in existence, how are the groups currently working in response to the problems the community is facing? • Do you face any challenges in responding to problems of floods? What challenges do you face?
Institutional response to floods	<ul style="list-style-type: none"> • Do you get assistance from the government or NGOs when crops fail as a result of floods or when your homes get flooded? Is there a specific year you remember getting assistance because your crops failed or your homes got flooded? • What kind of assistance? (Relocation, advice on CA, etc, fertilizer inputs, food packages, financial?) • How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support? • List which organisations that assisted you and with what support? • Was the support something that was relevant for your adaptation to flood situations? • Was the support similar to what you do to adapt when you experience flooding or it was something very new? If it was new, did the support challenge the way you do things to respond? • What are the main constraints you feel about this? • Is there a way you feel things should have been done better to improve on the support rendered? • Do you still interact with meso-level institutions? What do you see happening in your communities? • How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes? • Does the extension work done by meso-level institutions address your problems? • Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?
Droughts/Dry spells/Short intense rainfall	<ul style="list-style-type: none"> • Do you experience dry spells or droughts in this area? • When did you start observing dry spells or droughts in the area? Any examples of particular years within which your community experienced severe drought in the last 10 or 20 years? (What features can you pin point to say the year was a drought year? (Severe droughts, dried rivers/streams, wells/borehole that have run dry, crop failure etc?)) • What are the impacts of dry spells on local livelihood? • Do you experience short and intense rainfall in this area? • When did you start observing short and intense in the area? Any examples of particular years when started experiencing short and intense in the last 10 or 20 years? (What features can you pin point to say the year was characterised by short and intense rainfall? (Severe flooding, rivers/streams overflowing, crop failure etc.?)) • What are the impacts of short and intense rainfall on local livelihood?

<p>Community Responses to Dry Spells and/or short and intense rainfall</p>	<ul style="list-style-type: none"> • As a community or at household level, what do you do to resolve the problem of dry spells? • Do you face any challenges in responding to problems of dry spells or short and intense rainfall? What challenges do you face? • When responding to the problem of droughts or short intense rainfall, is/was there a time when the community came together to form community based groups to try and resolve these problems? • How do/did the community decide who needed to be part of the group? • What kind(s) of activities are/is undertaken in these groups? • If the groups are in existence, how are the groups currently working in response to the problems the community is facing?
<p>Institutional response to dry spells and/or short and intense rainfall</p>	<ul style="list-style-type: none"> • Do you get assistance from the government or NGOs when crops fail as a result of dry spells or drought? Is there a specific year you remember getting assistance because your crops failed? • What kind of assistance? (Advice on CA, etc. fertilizer inputs, food packages, financial?) • How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support? • List which organisations that assisted you and with what support? • Was the support something that was relevant for your adaptation to responding to the problem of dry spells? • Was the support similar to what you do to adapt when you experience dry spells or it was something very new? If it was new, did the support challenge the way you do things to respond when faced with dry spells? • What are the main constraints you feel about this? • Is there a way you feel things should have been done better to improve on the support rendered? • Do you still interact with meso-level institutions? What do you see happening in your communities? • How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes? • Does the extension work done by meso-level institutions address your problems? • Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?

APPENDIX 13: INTERVIEW GUIDE USED FOR THE PARTICIPATORY APPRAISAL EXERCISES

EXERCISE 1

Putting climate change problems into contexts compared to other problems they experience

- list the main challenges for household food security (or in general)
- Draw a symbol on paper to illustrate each of these problems
- Rank the problems in order of importance by putting stones next to each problem (the more stones, the more important)
- Record household challenges in order of community importance

EXERCISE 2

- Seasonal calendar using things people are familiar with e.g. forests, agricultural land, water, livestock; crop yield (Is there an increase or decrease over the years).

APPENDIX 14: RESULTS OF THE FOCUSED GROUP DISCUSSIONS

FOCUS GROUP DISCUSSION RESULTS

For structured interviews

PROVINCE:	WESTERN
DISTRICT:	SESHEKE
WARD:	MWANDI
VILLAGE/SETTLEMENT:	MWANDI CENTRAL
DATE:	13/04/2014

NAMES OF PARTICIPANTS

1. Kweleka Lubasi
2. Siyalela Siyalela
3. Munakayumbwa Lubasi
4. Nyambe Muyunda
5. Isabel Mataliya
6. Lubinda Abraham
7. Mike Simalumba
8. Simasiku Liwena
9. Mufana Lusulo

10. Nakambowa Simata
11. Mwenda Lubasi
12. Mushabati Chibwe
13. Pecksina Songiso
14. Manga Simasiku
15. Morgan Mutakela

CLIMATE CHANGE IN THE STUDY AREA	QUESTIONS	RESPONSES
Floods	<ol style="list-style-type: none"> 1. Do you experience floods in this area? 2. When did you start observing the floods? Any examples of particular years within which your community experienced severe flooding in the last 10 or 20 years? <i>Other examples can be extreme floods, but also everyday local events e.g. small local floods etc.</i> 3. What do you think is the cause of floods? 4. What are the impacts of floods on local livelihood? 	<ol style="list-style-type: none"> 1. Area experiences floods 2. Started experiencing floods since 1978. Extreme floods experienced within the same year of 1978 and again 2010 when people had to be relocated upper lands. Other smaller floods that came close to home dwellings were experienced in 2002, 2006, 2008 3. Floods caused by too much rainfall in the North that recedes to flood low lands. Sometimes, flooding of the local rivers causes water to flood low lands used for crop growing and home dwellings. Underground water saturation also causes flooding because rain water fails to percolate in the ground and hence flows uncontrollably. 4. Loss of crops when fields get flooded. Disruption of people's general livelihoods especially when they have to relocate because it means new ways of money making ventures must be thought of in a new place and schools for children have to change. Additionally, floods limit grazing areas for livestock; limited access to relish because

		floods scatter fish in rivers making it hard for fishermen/women to catch it. Moreover, mosquitoes increase in number due to rampant breeding in the flood stagnant waters. Further, hippos move closer to homesteads and destroy crop fields and property. Crocodiles attacking humans and livestock increase when there are floods because they too move closer freely in the flood waters towards people's home dwellings.
Community Response to Floods	<p>5. What do you do as a community or at household level, when resolving the problem of floods?</p> <p>6. When responding to the problem of floods, is/was there a time when the community came together to form community based groups to try and resolve these problems?</p> <p>7. How do/did the community decide who should be part of the group?</p> <p>8. What kind(s) of activities are/is undertaken in these groups?</p> <p>9. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p> <p>10. Do you face any challenges in responding to problems of floods? What challenges do you face?</p>	<p>5. As a community, we lodge complaints to local leadership and extension workers when faced with floods. At household level, we find alternative drier lands to relocate to as a temporary measure. Crops are left in the flooded water and fail to mature for that flood year. Also engage in small businesses to earn money and buy food.</p> <p>6. Communities don't come together to respond to floods collectively. Such responses are done at household level.</p> <p>7. Not applicable</p> <p>8. Not applicable</p> <p>9. Not applicable</p> <p>10. Not applicable</p>
Institutional response to floods	11. Do you get assistance from the government or NGOs when crops fail as a result of floods or when your homes get flooded? Is there a specific year you remember getting assistance because your crops	11. Yes, there was assistance in terms of accessing clean water from Mwandi Fish farm when shallow wells got flooded and chlorine was given to us by Mwandi Mission Hospital. Extension officers under the Department of Agriculture advised us to cultivate away from

	<p>failed or your homes got flooded? What kind of assistance? (Relocation, advice on CA, etc, fertilizer inputs, food packages, financial and which organisations assisted you and with what support?</p> <p>12. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>13. Was the support something that was relevant for your adaptation to flood situations?</p> <p>14. Was the support similar to what you do to adapt when you experience flooding or it was something very new? If it was new, did the support challenge the way you do things to respond?</p> <p>15. What are the main constraints you feel about this?</p> <p>16. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>17. Do you still interact with meso-level institutions? What do you see happening in your communities?</p>	<p>flood prone areas. Additionally, seeds were provided to replace flooded crops. In 2013, there was support of mosquito nets for communities residing close to flooded area by the Rotary International Organisation.</p> <p>12. Existing community leaders such as headmen “<i>ndunas</i>” make known to relevant authorities of flood occurrences. These are selected through a family linear system.</p> <p>13. The support of mosquito nets and chlorine was not relevant because it did not take away challenges of food insecurities because this was the major problem brought about by floods.</p> <p>14. Using chlorine to purify water and cultivating away from flood prone areas was similar to what communities did to avoid getting diarrhoea and having water flooding crops, respectively.</p> <p>15. The major constraint was that the chlorine was only provided to a few households i.e. 25 households only and was just a once off thing. Moreover, addressing the water problem was not the primary concern for the communities. What was required was to address food shortages.</p> <p>16. Could have been provided with food. Additionally, communities could have been provided with rice seeds so that they grow in the flood plains. It would have been helpful to allow people to use the flood plains to grow rice rather than only allowing cattle to graze. Partitions could have been made and shared between rice growers and cattle owners so that equal opportunities of earning incomes could be realised between people with livestock and those without.</p> <p>17. We hardly interact with meso level institutions. They are only seen when they need to address something of particular interest.</p>
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	<p>18. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>19. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>18. Extension of meso level institutions is something that cannot be relied upon because they hardly visit communities and have little knowledge of the kind of problems communities face.</p> <p>19. Extension advice is rare when floods are experienced so there is not much to be commented on regarding their support.</p>
<p>Dry Spells or Drought Conditions and/or short and intense rainfall</p>	<p>20. Do you experience dry spells or droughts in this area?</p> <p>21. When did you start observing dry spells or droughts in the area? Any examples of particular years within which your community experienced severe drought in the last 10 or 20 years? (What features can you pin point to say the year was a drought year? (Severe droughts, dried rivers/streams, wells/borehole that have run dry, crop failure etc.?)</p> <p>22. What are the impacts of dry spells on local livelihood?</p> <p>23. Do you experience short and intense rainfall in this area?</p> <p>24. When did you start observing short and intense in the area? Any examples of particular years when started experiencing short and intense in the last 10 or 20 years? (What features can you pin point to say the year was characterised by short and intense</p>	<p>20. Area experiences a lot of drought</p> <p>21. Started experiencing droughts in the early 2000s. Particular years of drought include 2002, 2003, 2005, 2012 and 2013. These years are significant because crops dried up due to insufficient rainfall. Small rivers, water dambos, wells and boreholes also started drying out. To date, the drying up of water sources is phenomena that characterises the biophysical nature of the area.</p> <p>22. Impacts include food shortages, severe famine, and increased sicknesses due to poor nutrition, malnutrition in children, reduced grazing pastures and livestock dying from hunger. Other impacts included increased crocodile attacks on humans who visit the Zambezi River to access drinking water when local streams dry up.</p> <p>23. In 2013, the rainfall was intense but only lasted for a short period, starting from late November to January. Crops failed to mature because rains stopped very early before the maturity period.</p> <p>24. Observing short intense rainfall started in 2005 to date.</p>

	<p>rainfall? (Severe flooding, rivers/streams overflowing, crop failure etc.?)</p> <p>25. What are the impacts of short and intense rainfall on local livelihood?</p>	<p>25. Impacts include crop failure and severe food insecurities. Additionally, livestock die of hunger when there is severe drought.</p>
<p>Community Responses to Dry Spells and/or short and intense rainfall</p>	<p>26. As a community or at household level, what do you do to resolve the problem of dry spells?</p> <p>27. Do you face any challenges in responding to problems of dry spells or short and intense rainfall? What challenges do you face?</p> <p>28. When responding to the problem of droughts or short intense rainfall, is/was there a time when the community came together to form community based groups to try and resolve these problems?</p> <p>29. How do/did the community decide who needed to be part of the group?</p> <p>30. What kind(s) of activities are/is undertaken in these groups?</p>	<p>26. At community level, there are no communal activities for responding to droughts. However, at household level, men engage in fishing activities to sustain their livelihoods and women brew beer for sell and sometimes engage in businesses of buying and selling of fish. Cattle are also taken to the Zambezi River to access water if it can no longer be obtained from nearby sources close to homesteads.</p> <p>27. A lot of lives have been lost from crocodile and hippo attacks for fishermen who risk their lives catching fish. Moreover, the Zambian side of the river has limited fish stocks due to over fishing and too many people catching fish when trying to support families after a drought year. Hence fishermen go as far as the Namibian side to catch fish. In so doing, they end up being arrested for fishing in a foreign country. Cattle are also stolen when taken to the main river to drink water by cattle rustlers.</p> <p>28. The community came together to form poultry farming group of growing village chickens to try and resolve challenges of droughts or short intense rainfall. The idea was that when a group member was faced with problems e.g. crop failure; the group could lend them money from the chicken business so that they sustained their households and pay back when they had raised the funds.</p> <p>29. Any community member with the willingness to participate was allowed to join.</p> <p>30. There are no activities taking place because these activities did not kick start. Commitment was expressed but no one really started the whole programme as it is still on paper.</p> <p>31. Nothing is going on in the groups</p>

	31. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?	
Institutional response to dry spells and/or short and intense rainfall	<p>32. Do you get assistance from the government or NGOs when crops fail as a result of dry spells or drought? Is there a specific year you remember getting assistance because your crops failed?</p> <p>33. What kind of assistance? (Advice on CA, etc, fertilizer inputs, food packages, financial?) And which organisations assisted you and with what support?</p> <p>34. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>35. Was the support something that was relevant for your adaptation to responding to the problem of dry spells?</p>	<p>32. Yes, assistance is rendered when crops fail as a result of drought or dry spells. In 2005 people affected by drought were supported with various foodstuffs. In 2000 and 2002, there was fertilizer support to improve crop output following failed maize production the previous years. Additional, following dying of cattle, restocking of livestock in form of goats was done by some NGOs. Goat distribution has been taking place since 2010 to date.</p> <p>33. Support rendered in terms of food was Maize, Sorghum, Wheat, Cow Peas and cooking oil, supported by Care International Zambia. Fertilizer support was supported by the World Food Programme (WFP) where as livestock i.e. goats were supported the Programme Urban Self Help (PUSH) and Land O' Lakes.</p> <p>34. Agricultural extension officers with the help of local councillors solicited for the support after evaluating the extent of damage to crops and thought that would be some of the best ways to support affected communities.</p> <p>35. To some extent, the food support was relevant because it addressed hunger problems faced by people. However, most people did not benefit from the support because people entrusted with redistributing foodstuffs kept most of it for themselves and were selective in the way they distributed. Only close friend and related benefited. And because, the communities are not in charge of soliciting for the support, they are sometimes given things that they do not need such as fertilizer inputs. In Mwandu area, fertilizers are not used because they deteriorate the already poor soil and thus such report is not relevant for adaptation.</p>

	<p>36. Was the support similar to what you do to adapt when you experience dry spells or it was something very new? If it was new, did the support challenge the way you do things to respond when faced with dry spells?</p> <p>37. What are the main constraints you feel about this?</p> <p>38. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>39. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>40. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do</p>	<p>36. The support of restocking livestock and fertilizer input was not similar to what communities do to respond when they experienced dry spells. The challenge of how things are done was on the fertilizer support because people were required to produce enough crops to show for the fertilizer given when it was not relevant for the types of soils they had. Equally, restocking livestock was not similar to what people do when faced with dry spells because at such times, livestock is sold to buy food. Restocking only takes place when people have bumper harvests and have enough money to restock their livestock.</p> <p>37. The main constraints of being supported with fertilizer is that it fails to address the problem of dry spells and still crop yields never improve. Support of foodstuffs is relevant as it addresses the immediate hunger problems faced by communities. Similarly, restocking of livestock is relevant because though it does not address the hunger problem immediately, growing and selling of such livestock help alleviate a number of problems when in serious need.</p> <p>38. Support could have been improved by assigning responsible and honest people to redistribute the food and livestock. Additionally, other than supporting people with fertilizer that they did not need, it could have been helpful to put up dams so that people could irrigate crops when rained failed and also use them for gardening purposes.</p> <p>39. Communities interacted with previous institutions such as Care International. However, they are no longer working within the area and hence no more interaction with them. Existing institutions are not known and hence currently, there is no interaction with meso level institutions, thus nothing is happening in communities.</p> <p>40. Extension workers do not address problems they face. Their support can not be depended on because it is limited to a few people within communities. Besides, it takes a long time for institutions to respond when communities are faced with challenges. If nothing was done at</p>
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	<p>you use institutions to respond to your problem of the climate and environmental changes?</p> <p>41. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>household level to survive, people would face serious hunger problems.</p> <p>41. At times when advised to do something by institutions e.g. conservation agriculture, we do things differently because it is not easy to always dig holes when farming big fields. Additionally, certain types of weeds grow well in pot holes meant for food crops and thus difficult to control.</p>
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PROVINCE:

SOUTHERN

DISTRICT:

KAZUNGULA

WARD:

SIKAUNZWE

VILLAGE/SETTLEMENT:

KAWANA

DATE:

17/04/2014

NAMES OF PARTICIPANTS

1. Faustina Munkongole
2. Christina Kekelwa
3. Fides Nafu
4. Charity Munkolwa
5. Kekelwa Kawana
6. Mbangweta Simasiku
7. Daisy Kawana

8. Angela Silenga

9. Mungole Kawana

CLIMATE CHANGE IN THE STUDY AREA	QUESTIONS	RESPONSES
Floods	<ol style="list-style-type: none"> 1. Do you experience floods in this area? 2. When did you start observing the floods? Any examples of particular years within which your community experienced sever flooding in the last 10 or 20 years? <i>Other examples can be extreme floods, but also everyday local events e.g. small local floods etc</i> 3. What do you think is the cause of floods? 4. What are the impacts of floods on local livelihood? 	<ol style="list-style-type: none"> 1. Experience floods in the area 2. Started experiencing floods in 1999, with minimal floods and extreme floods in 2008 3. Floods are caused by bursting of Ngwezi River. Short intense rainfall also causes flooding. 4. Destruction of crops and homesteads, food insecurities and hunger. Floods also cause soil erosion, hence causes gullies in roads making them impassable after waters recede to the rivers.
Community Response to Floods	<ol style="list-style-type: none"> 5. What do you do as a community or at household level, when resolving the problem of floods? 6. When responding to the problem of floods, is/was there a time when the community came together to form community based groups to try and resolve these problems? 7. How do/did the community decide who should be part of the group? 8. What kind(s) of activities are/is undertaken in these groups? 	<ol style="list-style-type: none"> 5. Catch and sell fish to earn incomes when crops fail as a result of getting flooded. Also cut and sell grass used for thatching houses. 6. Community groups called Lima Clubs were formed after discovering and emulating what other communities have done to resolve challenges of food insecurities when crops failed as a result of floods or drought. 7. Decision on joining the community club is based on willingness of any community member to contribute the required amounts. 8. Members of such groups contribute a small fee of K10 every month and saved in confers to be accessed in rainy days. Equally, members

	<p>9. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p> <p>10. Do you face any challenges in responding to problems of floods? What challenges do you face?</p>	<p>contribute money to buy fabric for sowing table clothes and bed sheets that can then be sold. Club members also make reed mats for sale and save funds in community the bank. In addition, club members also bake bread and scorns for sale to raise funds. The funds raised in these groups are meant to assist members in need money or facing challenges. Members can borrow money from the club funds and return it with interest once they are able to refund the used up funds.</p> <p>9. The groups are not working well because some members fail to repay the funds after using it. Sometimes, some members desert the group after borrowing so that they can not refund the money. This has caused confusion and consistent paying members have since been reluctant to make their annual contribution of the fees or participate in fund raising activities for the club.</p> <p>10. Because some members fail to pay back the money borrowed, when crops fail as a result of floods, there is still suffering because funds are unavailable to assist club members cope. As a result, households just catch fish and cut grass that is sold to earn incomes and buy food.</p> <p>In addition, catching of fish for sale to earn incomes is not always guaranteed because during flood times in December to March, there is a fish ban. This means that if found catching fish during this period, there are severe consequences to face with the law.</p>
<p>Institutional response to floods</p>	<p>11. Do you get assistance from the government or NGOs when crops fail as a result of floods or when your homes get flooded? Is there a specific year you remember getting assistance because your crops failed or your homes got flooded? What kind of assistance? (Relocation, advice on CA, etc,</p>	<p>11. There has been no assistance from any institution to the community when crops failed as a result of floods.</p>

	<p>fertilizer inputs, food packages, financial and which organisations assisted you and with what support?</p> <p>12. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>13. Was the support something that was relevant for your adaptation to flood situations?</p> <p>14. Was the support similar to what you do to adapt when you experience flooding or it was something very new? If it was new, did the support challenge the way you do things to respond?</p> <p>15. What are the main constraints you feel about this?</p> <p>16. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>17. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>18. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>19. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>12. Not applicable</p> <p>13. Not applicable</p> <p>14. Not applicable</p> <p>15. Not applicable</p> <p>16. Not applicable</p> <p>17. Not applicable</p> <p>18. Not applicable</p> <p>19. Not applicable</p>
<p>Dry Spells or Drought Conditions and/or short and intense rainfall</p>	<p>20. Do you experience dry spells or droughts in this area?</p> <p>21. When did you start observing dry spells or droughts in the area? Any examples of particular years within which your community experienced severe drought in the last 10 or 20 years? (What features can you</p>	<p>20. Area experiences dry spells and droughts</p> <p>21. Started observing dry spells in 1995 onwards. In 1995, there was a severe dry spell that resulted in extreme crop failure. In 1996, there was another dry spell. In the years that followed, streams and rivers</p>

	<p>pin point to say the year was a drought year? (Severe droughts, dried rivers/streams, wells/borehole that have run dry, crop failure etc?)</p> <p>22. What are the impacts of dry spells on local livelihood?</p> <p>23. Do you experience short and intense rainfall in this area?</p> <p>24. When did you start observing short and intense in the area? Any examples of particular years when started experiencing short and intense in the last 10 or 20 years? (What features can you pin point to say the year was characterised by short and intense rainfall? (Severe flooding, rivers/streams overflowing, crop failure etc?)</p> <p>25. What are the impacts of short and intense rainfall on local livelihood?</p>	<p>started getting dry as early as May and were dry the rest of the dry season.</p> <p>22. Crop failure is the major impact of drought.</p> <p>23. Experience short intense rainfall</p> <p>24. In 2006 and 2007, the area experienced extreme intense rainfall of 10 to 14 days non-stop. Other similar rains were experienced in 2013/2014 rainy season.</p> <p>25. Short intense rainfall submerge crops and causes rivers to overflow. Cattle and goats also start experiencing foot and skin diseases due to over exposure to wet conditions.</p>
<p>Community Responses to Dry Spells and/or short and intense rainfall</p>	<p>26. As a community or at household level, what do you do to resolve the problem of dry spells?</p> <p>27. Do you face any challenges in responding to problems of dry spells or short and intense rainfall? What challenges do you face?</p> <p>28. When responding to the problem of droughts or short intense rainfall, is/was there a time when the community came together to form community based groups to try and resolve these problems?</p>	<p>26. Catch and sell fish to earn incomes when crops fail as a result of getting flooded. Also cut and sell grass used for thatching houses.</p> <p>27. When there is short intense rainfall, areas get flooded and maize crops fail to mature. However, some good areas where alternative crops can be cultivated such as rice are difficult to find. To access such land, you have to rent from people with good flooded land and sometimes fees to use the land are high and money is not always readily available.</p> <p>28. Community groups called Lima Clubs were formed after discovering and emulating what other communities have done to resolve challenges of food insecurities when crops failed as a result of floods or drought.</p>

	<p>29. How do/did the community decide who needed to be part of the group?</p> <p>30. What kind(s) of activities are/is undertaken in these groups?</p> <p>31. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p>	<p>29. Decision on joining the community club is based on willingness of any community member to contribute the required amounts.</p> <p>30. Members of such groups contribute a small fee of K10 every month and saved in confers to be accessed in rainy days. Equally, members contribute money to buy fabric for sowing table clothes and bed sheets that can then be sold. Club members also make reed mats for sale and save funds in community the bank. In addition, club members also bake bread and scorns for sale to raise funds. The funds raised in these groups are meant to assist members in need money or facing challenges. Members can borrow money from the club funds and return it with interest once they are able to refund the used up funds.</p> <p>31. The groups are not working well because some members fail to repay the funds after using it. Sometimes, some members desert the group after borrowing so that they can not refund the money. This has caused confusion and consistent paying members have since been reluctant to make their annual contribution of the fees or participate in fund raising activities for the club.</p>
<p>Institutional response to dry spells and/or short and intense rainfall</p>	<p>32. Do you get assistance from the government or NGOs when crops fail as a result of dry spells or drought? Is there a specific year you remember getting assistance because your crops failed?</p> <p>33. What kind of assistance? (Advice on CA, etc, fertilizer inputs, food packages, financial?) And which organisations assisted you and with what support?</p>	<p>32. In years of severe drought, government assists communities to cope when crops fail as a result of drought or dry spells.</p> <p>33. Food staffs in form of maize, cooking oil and wheat. Advice on conservation agriculture is given to community members so that they improve their yields in subsequent years. Lead Farmers are also taught good farming methods and provided with seeds. There after, the Lead Farmers, after getting training from extension officers, also train community members on improved farming methods that can guarantee good yield in the subsequent years. The lead farmers are also provided with quality maize that is distributed to other</p>

	<p>34. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>35. Was the support something that was relevant for your adaptation to responding to the problem of dry spells?</p> <p>36. Was the support similar to what you do to adapt when you experience dry spells or it was something very new? If it was new, did the support challenge the way you do things to respond when faced with dry spells? What are the main constraints you feel about this?</p> <p>37. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>38. Do you still interact with meso-level institutions? What do you see happening in your communities?</p>	<p>community members to use. Other support was in form of goats under the livestock restocking programme by Land O' Lakes.</p> <p>34. Through interactions with community extension workers, they were able to note what challenges the communities were facing and they notified various NGOs and the District Offices.</p> <p>35. When crops failed, provision of food staffs was relevant because it alleviated hunger problems the communities were facing. In addition, benefits have been seen from the use of conservation agriculture in that when used properly, the yield is big.</p> <p>36. Conservation agriculture is a new and better form of agriculture method in dryer area. The challenge is that it is labourious and people with low strength levels fail to use it effectively.</p> <p>37. Provision of food staffs and advice on conservation agriculture and other farming techniques was done excellently. However, during the distribution of goats, only a few people were provided with goats and most of them have still not passed on to their neighbours. Moreover, there is need for time passage for goats to grow; meaning using such means to adapt takes a lot of time. In times when there is crop failure as a result of drought, small goats can not be sold to earn money. Equally, if one is still under the period of being required to pass on the goats to the neighbour, they can not sell the livestock to buy maize or any other food.</p> <p>38. Interaction is there with Caritas and Land O' Lakes. Caritas provides maize seeds to farmers where as Land O' Lakes distributes goats to households.</p>
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	<p>39. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>40. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>39. The extension of NGOs is very relevant especially provision of seed because we hardly access quality treated seeds from towns due to lack of resources and long distance covered. These seeds are relied on because they produce good yields compared to untreated local seeds.</p> <p>40. Normally, people do things as they are advised to adapt</p>
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PROVINCE:

SOUTHERN

DISTRICT:

KAZUNGULA

WARD:

NGWEZI

VILLAGE/SETTLEMENT:

SIANKANDE

DATE:

20/04/2014

NAMES OF PARTICIPANTS

1. Clement Chika
2. David Simasiku
3. Gibson Simasiku
4. John Siachika
5. Rosemary Sianamwe

6. Moses Malambo
7. Mary Chilambwe
8. Habeenzu Moonga

CLIMATE CHANGE IN THE STUDY AREA	QUESTIONS	RESPONSES
Floods	<ol style="list-style-type: none"> 1. Do you experience floods in this area? 2. When did you start observing the floods? Any examples of particular years within which your community experienced severe flooding in the last 10 or 20 years? <i>Other examples can be extreme floods, but also everyday local events e.g. small local floods etc</i> 3. What do you think is the cause of floods? 4. What are the impacts of floods on local livelihood? 	<ol style="list-style-type: none"> 1. Yes, area experiences floods 2. Started experiencing floods since the early 2000s. We experience too much water in the homes and fields destroying crops in the fields. There is also a new weed which attacks fields in flood years. 3. Floods are caused by too much rainfall which is experienced for short periods but very intense. 4. Goats experience a very bad skin disease when the area is too flooded which normally leads to eradication of the small livestock. Floods also cause foot and mouth disease for cattle. The weed that attacks crop fields is very intrusive and erodes the opportunity for crops to mature properly. Floods also reduce the possibility of crops maturing properly.
Community Response to Floods	<ol style="list-style-type: none"> 5. What do you do as a community or at household level, when resolving the problem of floods? 6. When responding to the problem of floods, is/was there a time when the community came together to 	<ol style="list-style-type: none"> 5. At community level, people come together to form farming clubs for vegetable growing and at household level, people also buy livestock e.g. cattle, goats and chickens that could be sold when crops fail as result of floods. 6. Yes, as above

	<p>form community based groups to try and resolve these problems?</p> <p>7. How do/did the community decide who should be part of the group?</p> <p>8. What kind(s) of activities are/is undertaken in these groups?</p> <p>9. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p> <p>10. Do you face any challenges in responding to problems of floods? What challenges do you face?</p>	<p>7. Anyone interested was allowed to join the farming group</p> <p>8. Growing and selling of vegetables to the market to raise income that could be used when crops fail as a result of drought or floods.</p> <p>9. The groups are working because people have the willingness to participate. However, there are others who do not want to participate and that can be challenging. Moreover, crop inputs like seedlings are not easily accessible because the distances that have to be covered to access them are quite long.</p> <p>10. Problems are there because floods encourage the growth of thorny plants that are not good for vegetable production. The area also gets to be too wet for any activities to take place. In addition, livestock skin diseases are on the increase when areas are constantly wet.</p>
<p>Institutional response to floods</p>	<p>11. Do you get assistance from the government or NGOs when crops fail as a result of floods or when your homes get flooded? Is there a specific year you remember getting assistance because your crops failed or your homes got flooded? What kind of assistance? (Relocation, advice on CA, etc, fertilizer inputs, food packages, financial and which organisations assisted you and with what support?</p> <p>12. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>13. Was the support something that was relevant for your adaptation to flood situations?</p>	<p>11. In 2012, NGOs i.e. Africa Now and Sekute Conservancy Trust, came up with a livestock restocking programme where goats were given to selected few households to grow and later pass on the goat kids to other community members when the goats multiply.</p> <p>12. The NGOs had taken a tour around villages to see how people were faring and were notified of the problems communities faced when crops failed as a result of floods. This was discussed at a meeting called up by the local headman.</p> <p>13. The support was relevant to help with adaptation because when crops fail, people have something to fall back on. They can sell their goats</p>

	<p>14. Was the support similar to what you do to adapt when you experience flooding or it was something very new? If it was new, did the support challenge the way you do things to respond?</p> <p>15. What are the main constraints you feel about this?</p> <p>16. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>17. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>18. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>19. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>and still earn incomes other than just depending on maize which tends to fail in times of floods.</p> <p>14. People have always reared livestock in the community except that now there is the aspect of passing on goats to other community members when they multiply which is a new phenomenon to the community.</p> <p>15. The challenge is that despite the NGOs stipulating that goats should be passed on to other community members, some still refuse to do so even after the goats multiply. As a consequence, other people still fail to grow their own livestock and conflicts arise.</p> <p>16. Everybody should have been given livestock, not just a selected few to avoid confusion and being denied of access to rearing goats by some uncooperative people</p> <p>17. Other than the mentioned NGOs, no other NGOs or government officials visit the area. This includes agricultural extension officers. So really, there is nothing that can be said to be happening with regards meso-level institutions.</p> <p>18. The extension of meso-level institutions is not something that can be relied up. Agricultural extension officers do not visit the area and the NGOs have since left after initiating a goat pass on programme without making follow ups to see how it is working.</p> <p>19. In terms of agricultural extension work, the community does what they have always done because agricultural extension officers do not visit the area. With regard livestock (goat) pass on programme, some people abide to what the NGOs advised where as others refuse to pass on the kids of the goats.</p>
<p>Dry Spells or Drought Conditions and/or short and intense rainfall</p>	<p>20. Do you experience dry spells or droughts in this area?</p> <p>21. When did you start observing dry spells or droughts in the area? Any examples of particular</p>	<p>20. Yes, droughts are experienced.</p> <p>21. Severe droughts were experienced in 1995 and 1998. As a consequence, crops dried out and the river dried out.</p>

	<p>years within which your community experienced sever drought in the last 10 or 20 years? (What features can you pin point to say the year was a drought year? (Severe droughts, dried rivers/streams, wells/borehole that have run dry, crop failure etc?)</p> <p>22. What are the impacts of dry spells on local livelihood?</p> <p>23. Do you experience short and intense rainfall in this area?</p> <p>24. When did you start observing short and intense in the area? Any examples of particular years when started experiencing short and intense in the last 10 or 20 years? (What features can you pin point to say the year was characterised by short and intense rainfall? (Severe flooding, rivers/streams overflowing, crop failure etc?)</p> <p>25. What are the impacts of short and intense rainfall on local livelihood?</p>	<p>22. Crop failure is the major impact of drought. Water sources such are local streams and rivers also dry out. Livestock lack sufficient water for drinking.</p> <p>23. Yes, short intense rainfall are experienced</p> <p>24. Each season, short intense rainfall is experienced that bring about flooding in the community and damaging crops.</p> <p>25. Crop failure, too much wetness of the area, livestock skin diseases</p>
<p>Community Responses to Dry Spells and/or short and intense rainfall</p>	<p>26. As a community or at household level, what do you do to resolve the problem of dry spells?</p> <p>27. Do you face any challenges in responding to problems of dry spells or short and intense rainfall? What challenges do you face?</p> <p>28. When responding to the problem of droughts or short intense rainfall, is/was there a time when the</p>	<p>26. At community level, people come together to form farming clubs for vegetable growing and at household level, people also buy livestock e.g. cattle, goats and chickens that could be sold when crops fail as result of floods/droughts.</p> <p>27. Lack of inputs/ seedling for vegetables. Long distances covered to access them.</p> <p>28. Yes, in (26)</p>

	<p>community came together to form community based groups to try and resolve these problems?</p> <p>29. How do/did the community decide who needed to be part of the group?</p> <p>30. What kind(s) of activities are/is undertaken in these groups?</p> <p>31. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p>	<p>29. Anyone interested was allowed to join the farming group</p> <p>30. Growing and selling of vegetables to the market to raise income that could be used when crops fail as a result of drought or floods.</p> <p>31. The groups are working because people have the willingness to participate. However, there are others who do not want to participate and that can be challenging. Moreover, crop inputs like seedlings are not easily accessible because the distances that have to be covered to access them are quite long.</p>
<p>Institutional response to dry spells and/or short and intense rainfall</p>	<p>32. Do you get assistance from the government or NGOs when crops fail as a result of dry spells or drought? Is there a specific year you remember getting assistance because your crops failed?</p> <p>33. What kind of assistance? (Advice on CA, etc, fertilizer inputs, food packages, financial?) And which organisations assisted you and with what support?</p> <p>34. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p> <p>35. Was the support something that was relevant for your adaptation to responding to the problem of dry spells?</p> <p>36. Was the support similar to what you do to adapt when you experience dry spells or it was something very new? If it was new, did the support challenge the way you do things to respond when faced with</p>	<p>32. During droughts, assistance was rendered to the community</p> <p>33. Food packages, fertiliser inputs and crop inputs.</p> <p>34. When passing through the communities, the NGOs discovered that the area had been hard hit by drought and hence decided to come in and be of assistance.</p> <p>35. The support was relevant because food packages sustained people's livelihoods.</p> <p>36. Households do not store food packages to use when they do not have a food because the majority sell all the produce to Food Reserve Agency (FRA) hence, it cannot be said that it is something they do to respond. However, there are households that still preserve some crop produce to use in the subsequent years.</p>

	<p>dry spells? What are the main constraints you feel about this?</p> <p>37. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>38. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>39. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>40. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>37. The food was sufficient and people got to have access to food when in dire need of food supplies.</p> <p>38. People from government or NGOs do not frequently visit the area and there is no form of interaction with them.</p> <p>39. The extension of government workers can not be relied upon because it does not exist.</p> <p>40. Because there is no extension services rendered by government officials, people cultivate as they did in all these years.</p>
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PROVINCE:

SOUTHERN

DISTRICT:

KAZUNGULA

WARD:

SIKAUNZWE

VILLAGE/SETTLEMENT:

NAMAPANDE

DATE:

19/04/2014

NAMES OF PARTICIPANTS

1. Mwendabai Mushe
2. Likando Kalimukwa

3. Florence Mubita
4. Harrison Mulemwa
5. Nyambe Nyambe
6. Pezo Zuze
7. Mushabati Mubili
8. Maureen Mushiba
9. Bridget Chala
10. Dumisani Sampondo
11. Peter Nyambe
12. Wachama Zuze
13. Songiso Siyanga
14. Mbaita Silumelume
15. Jackline Masiye

CLIMATE CHANGE IN THE STUDY AREA	QUESTIONS	RESPONSES
Floods	<ol style="list-style-type: none"> 1. Do you experience floods in this area? 2. When did you start observing the floods? Any examples of particular years within which your community experienced sever flooding in the last 10 or 20 years? <i>Other examples can be extreme floods, but also everyday local events e.g. small local floods etc</i> 	<ol style="list-style-type: none"> 1. The area does not experience any floods 2. Not applicable

	<p>3. What do you think is the cause of floods?</p> <p>4. What are the impacts of floods on local livelihood?</p>	<p>3. Not applicable</p> <p>4. Not applicable</p>
Community Response to Floods	<p>5. What do you do as a community or at household level, when resolving the problem of floods?</p> <p>6. When responding to the problem of floods, is/was there a time when the community came together to form community based groups to try and resolve these problems?</p> <p>7. How do/did the community decide who should be part of the group?</p> <p>8. What kind(s) of activities are/is undertaken in these groups?</p> <p>9. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p> <p>10. Do you face any challenges in responding to problems of floods? What challenges do you face?</p>	<p>5. Not applicable</p> <p>6. Not applicable</p> <p>7. Not applicable</p> <p>8. Not applicable</p> <p>9. Not applicable</p> <p>10. Not applicable</p>
Institutional response to floods	<p>11. Do you get assistance from the government or NGOs when crops fail as a result of floods or when your homes get flooded? Is there a specific year you remember getting assistance because your crops failed or your homes got flooded? What kind of assistance? (Relocation, advice on CA, etc, fertilizer inputs, food packages, financial and which organisations assisted you and with what support?</p> <p>12. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p>	<p>11. Currently, homes do not get flooded but prior to being relocated to this area, support was rendered in 2006 and 2008. Support rendered was in form of food packages, shelter, relocation transport, beddings and clothes. Different organisations supported the people that were displaced by floods including the Local government, the Office of the District Commissioner, Care International Zambia, Zambia Army, and Zambia Air Force, Caritas Zambia, Land O' Lakes, Africare, UNICEF, Africa Now, The Catholic Churches and other churches including many other NGOs.</p> <p>12. The support came after being reported to the office of District Commissioner after being affected by floods. The media also got wind of the details of people being displaced and reported the</p>

	<p>13. Was the support something that was relevant for your adaptation to flood situations?</p> <p>14. Was the support similar to what you do to adapt when you experience flooding or it was something very new? If it was new, did the support challenge the way you do things to respond?</p> <p>15. What are the main constraints you feel about this?</p> <p>16. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>17. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>18. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p>	<p>incidence making it easier for a lot of people to come on board and support people who were displaced from their usual dwellings.</p> <p>13. The support was very relevant to help with adaptation because people were given a new hope after losing everything in the floods. Despite all food lost in the floods, people still had something to eat including being provided with alternative shelter. If these institutions had not come on board, a lot of people would have gone hungry and with nowhere to sleep.</p> <p>14. The flood situation of such magnitude was new to people and hence most of the responses or adaptation measures used were new too. The new support improved the worse situation of floods and alleviated people's suffering.</p> <p>15. No constraints</p> <p>16. After relocating people to a new place, fulfilment of promises made could have followed through. For instance, promises were made that a new clinic would be made. Up until now, there is still no health centre for people who live in this area. In addition, the community school built only has one trained teacher to cater for all pupils at the school. This is far from being realistic. Trained teachers should be employed to improve on the standards of learning. Further, there is need to improve the road systems so that public transport can reach the community. To get to the main road, one has to walk more than 15 kilometres to get there.</p> <p>17. Meso-level institutional interaction is there though not on a regular basis. The agricultural extension officers visit the community to offer support on agricultural work and also see what is happening with regards to the bee keeping project that was initiated.</p> <p>18. The extension of agricultural officer is very important and it is something the community can depend on because they guide us on how to farm properly e.g. conservation agriculture for improved crop</p>
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	<p>19. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>yield. In addition, with regards, bee keeping project, they support us by connecting us to market opportunities and this really works well.</p> <p>19. Generally, we do what the extension officers tell us to do because this has been working really well.</p>
<p>Dry Spells or Drought Conditions and/or short and intense rainfall</p>	<p>20. Do you experience dry spells or droughts in this area?</p> <p>21. When did you start observing dry spells or droughts in the area? Any examples of particular years within which your community experienced severe drought in the last 10 or 20 years? (What features can you pin point to say the year was a drought year? (Severe droughts, dried rivers/streams, wells/borehole that have run dry, crop failure etc?))</p> <p>22. What are the impacts of dry spells on local livelihood?</p> <p>23. Do you experience short and intense rainfall in this area?</p> <p>24. When did you start observing short and intense in the area? Any examples of particular years when started experiencing short and intense in the last 10 or 20 years? (What features can you pin point to say the year was characterised by short and intense rainfall? (Severe flooding, rivers/streams overflowing, crop failure etc?))</p> <p>25. What are the impacts of short and intense rainfall on local livelihood?</p>	<p>20. Yes, dry spell are experienced.</p> <p>21. Since 2009, some farming years have not been fruitful due to limited amounts of rains. Sometimes, we go for more than 2 weeks without seeing any rains.</p> <p>22. Drying of crops and drying out of water sources used for livestock and domestic uses. Livestock also lacks sufficient water for drinking.</p> <p>23. Yes, short intense rainfall are experienced</p> <p>24. Each season, short intense rainfall is experienced that water logs our crops.</p> <p>25. Crop failure and too much wetness of the area.</p>
<p>Community Responses to Dry</p>	<p>26. As a community or at household level, what do you do to resolve the problem of dry spells?</p>	<p>26. Lack of inputs/ seedling for vegetables. Long distances covered to access them.</p> <p>27. Yes, in (26)</p>

<p>Spells and/or short and intense rainfall</p>	<p>27. Do you face any challenges in responding to problems of dry spells or short and intense rainfall? What challenges do you face?</p> <p>28. When responding to the problem of droughts or short intense rainfall, is/was there a time when the community came together to form community based groups to try and resolve these problems?</p> <p>29. How do/did the community decide who needed to be part of the group?</p> <p>30. What kind(s) of activities are/is undertaken in these groups?</p> <p>31. If the groups are in existence, how are the groups currently working in response to the problems the community is facing?</p>	<p>28. Anyone interested was allowed to join the farming group</p> <p>29. Growing and selling of vegetables to the market to raise income that could be used when crops fail as a result of drought or floods.</p> <p>30. The groups are working because people have the willingness to participate. However, there are others who do not want to participate and that can be challenging. Moreover, crop inputs like seedlings are not easily accessible because the distances that have to be covered to access them are quite long.</p> <p>31. During droughts, assistance was rendered to the community</p>
<p>Institutional response to dry spells and/or short and intense rainfall</p>	<p>32. Do you get assistance from the government or NGOs when crops fail as a result of dry spells or drought? Is there a specific year you remember getting assistance because your crops failed?</p> <p>33. What kind of assistance? (Advice on CA, etc, fertilizer inputs, food packages, financial?) And which organisations assisted you and with what support?</p> <p>34. How did you get the support? Did you solicit for the support? Who was in charge of mobilizing the community to solicit the support? Why was this person in charge of soliciting the support?</p>	<p>32. Food packages, fertiliser inputs and crop inputs.</p> <p>33. When passing through the communities, the NGOs discovered that the area had been hard hit by droughts and hence decided to come in and be of assistance.</p> <p>34. The support was relevant because food packages sustained people's livelihoods.</p>

	<p>35. Was the support something that was relevant for your adaptation to responding to the problem of dry spells?</p> <p>36. Was the support similar to what you do to adapt when you experience dry spells or it was something very new? If it was new, did the support challenge the way you do things to respond when faced with dry spells? What are the main constraints you feel about this?</p> <p>37. Is there a way you feel things should have been done better to improve on the support rendered?</p> <p>38. Do you still interact with meso-level institutions? What do you see happening in your communities?</p> <p>39. How do you feel about the extension of meso-level institutions? Is it something that you depend on? Do you use institutions to respond to your problem of the climate and environmental changes?</p> <p>40. Do you do things differently than what you are advised to do, and why, and what constraints and problems do you see in this?</p>	<p>35. Households do not store food packages to use when they do not have a food because the majority sell all the produce to Food Reserve Agency (FRA) hence, it can not be said that it is something they do to respond. However, there are households that still preserve some crop produce to use in the subsequent years.</p> <p>36. The food was sufficient and people got to have access to food when in dire need of food supplies.</p> <p>37. People from government or NGOs do not frequently visit the area and there is no form of interaction with them.</p> <p>38. No</p> <p>39. It is ok</p> <p>40. Normally, we just do as we are told if it makes sense. Otherwise, we do our own things</p>
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APPENDIX 15: CHECKLIST USED FOR CONDUCTING WEALTH RANKING³²

The following is the checklist of activities for wealth ranking for use in the field.

1. Background Work to be done before Wealth Ranking is Begun

- Get a general sense of the ecological diversity in the area (*Such information can be obtained from government maps and reports, or census reports*)

i. Determine ecological Regions in target areas	<ul style="list-style-type: none"> - Surface area - Human population - Livestock population - Natural Conditions
ii. Within ecological Region, determine community differences	<ul style="list-style-type: none"> - Distance to town/market - Distance to road - Farmer group/development programme - Age of settlement - Ethnic groups - Relative wealth (and why) of different communities
iii. Select representative communities	
iv. Wealth rank within community	

2. General Background Activities

- Discuss levels of ‘community³³’; obtain words in local language
- Discuss local concept of ‘wealth³⁴’, decide on word or phrase
- Define ‘household³⁵’ in local language, obtain word or phrase.

3. Community Specific Background Activities

- Obtain names of all households; write on paper; verify and number them

³² *Wealth ranking* is based on a card-sorting technique in which the name of each household head is written on a small card and several informants are asked to place the cards in piles according to the wealth of each household i.e. a technique dependent upon ranking households of a community in relationship to each other.

³³ *Defining the community and its boundaries* – With the help of a local informant a general sense of local socio-spatial organisation is obtained. A community or neighborhood should contain 100 or less households. Again, it should not be too small otherwise sampling bias may occur

³⁴ *Wealth* is defined in terms of access to or control over important economic resources; it is often observed through higher levels of income (and expenditure) – but these are indicators of wealth rather than themselves constituting wealth. (To ensure the comparability of the data obtained from various informants, as well as to ensure that households are ranked according to the criteria the researcher desires, it is important to determine the best indigenous concept to use for ranking.

³⁵ *Household* is defined as a group of people (normally related) who live together and ‘eat from the same pot’.

- Write name and number of each household on index card
- Choose informant; explain basic nature of work
- Find quiet place to interview, best with table

4. Introduction to the Informant

Discuss:

- Purpose of your research
- How rich different from poor generally is the area
- How problems of rich and poor people are different
- Chosen word for wealth in local language
- Household concept; names on cards stand for whole household.

5. Actual Card Sorting

- Explain how it works; as many piles as he/she wants ; can change number in course of it
- Shuffle cards
- One by one, informant puts cards in piles
- Review each pile to be sure cards are placed in the right pile
- Count piles to make sure that there are no more than 40 percent of households in any one. If they are, ask informant to subdivide
- Write down household numbers by pile on a recording sheet

6. Follow up Discussions with Informants

- For each pile, ask informant what characterises these households generally
- Record responses by pile number
- Ask informant how these farmers differ in terms of specific goals of the project

Additional questions about the wealth ranking in relation to the study

- Are people from different wealth groups affected by climate change variations? Why do you say so?
- Are there any differences in access to institutional support over climate change variations between different wealth groups? Why do you say so?
- Are there differences in the way people from different wealth groups respond to climatic hazards? Why do you say that?

7. Repeat 3,4 and 5 with two to three more informants

8. Compute Average Score and Group

- Write household numbers down in a line
- Write score for each household for each informant

The Score is: $\frac{\text{Pile number of household} \times 100}{\text{Total number of piles}}$

Note: Pile 1 is the richest

- Compute average scores for each household as total of its score divided by the number of its score
- Household must have two scores to be included
- Write average score for each household in large numbers on the index cards
- Put index cards in order from lowest to highest average score (rich to poor)
- Copy on a sheet of paper in this order: the position number, the average score and the household number
- Divide into 3 groups of near equal size

APPENDIX 16: DESCRIPTIONS OF WEALTH RANKINGS AND TABULATIONS

1. WEALTH RANKING IN SIKUZU COMMUNITY

1.1 RECORDING RESPONSES OF WEALTH RANKINGS IN SIKUZU COMMUNITY

INFORMANT 1	
Informant:	MORGAN MUTAKELA
Sex:	MALE
Age:	54
Neighbourhood:	SIKUZU
Assistant:	MUNALULA LIBUWE
Date:	13/04/2014
Level 1 (Richest) :	7, 9, 16, 17, 40, 55, 56, 39, 44, 10,
Level 2: (Upper middle)	1, 8, 11, 12, 13, 14, 15, 19, 21, 22, 23, 27, 29, 30, 31, 38, 41, 43, 45, 47, 50
Level 3: (Lower middle)	3, 4, 5, 6, 25, 26, 32, 34, 35, 36, 37, 42, 46, 52, 54
Level 4 (Poorest):	2, 18, 20, 24, 28, 33, 48, 49, 51, 53, 57
COMMENTS	
<p>Well-being Level 1 Members of this group own cattle of around 10 and above. When it comes to farming, they do not rely on other people's draught power because they have their own oxen to use for ploughing. In times of famine or crop failure, they do not stay hungry because they can afford to sell their livestock to buy food and sustain their households. The community regards them to be better placed in society in terms of wealth as compared to the rest of the community.</p>	

Well-being Level 2

These own 1 or 2 cattle. Some also have children outside the village that support their livelihood from time to time. They do not need to work extra hard because their external family members living in town finance their food shortages in times of famine and floods. However, they cultivate their land to feed their households on a subsistence scale.

Well-being Level 3

People in this group do not own cattle. They cultivate their land and grow crops at a very small scale. They cultivate very small pieces of land because they have no draught power. They have to depend on other people with oxen to cultivate their land. Some of the people in this group only recently left their parents homes and started fending for themselves; hence they are not yet established. They also engage in fishing activities to survive. Within this same group, others are old and have support from relatives and external family members. When faced with drought or their crops fail as a result of floods, they can easily go fishing and do day labour to survive.

Well-being Level 4

Some of the people in this group are elderly people and some are widowed with no means of survival other than depending on community hand-outs. They also don't farm their lands because of lack of inputs. They generally have very limited or nothing to eat if no hand-outs is given. In times of drought or crop failure, they have to depend on the government for survival. While others will be able to work for the food, the majority have no strength to work for food supported by government hence they are given food free of charge. The government or NGOs also consider them first in priority when there is support for food or any form of support given to the community because they are considered to be the most vulnerable. If no support is given, they suffer the most because they can generally not cope when their crops are affected by droughts or floods because they have no alternative forms of income.

Additional comments

People from different wealth groups are affected by climate change differently and suffer from different challenges e.g. the very old especially in times of drought will primarily depend on government support for food while people strong enough to work will be able to work under the food for work programme to be given food, and may also do some piecework and also catch fish for sale to earn income. People in group one (i.e. the most well to do) for instance, can sell their own livestock to raise money even that which is required to educate their children.

In addition, there are differences in access to institutional support among different people from various wealth groups in that the poorest for instance are considered first when food and other relief packages are being distributed. Moreover, the poorest do not even need to work for food being distributed as it is just given to them for free.

Further, there are differences in response strategies among different wealth groups in that while the richest may sell their livestock to earn incomes following crop failure season, the middle and low income groups may engage in day labour and also catch fish as their source of livelihood.

INFORMANT 2	
Informant:	PHILIP CHIKEBA
Sex:	MALE
Age:	70
Neighbourhood:	SIKUZU
Assistant:	MUNALULA LIBUWE
Date:	13/04/2014
Level 1 (Richest):	7, 9, 10, 11, 14, 16, 17, 27, 33, 39, 44, 45, 55, 56, 57
Level 2 (Medium):	1, 2, 4, 6, 12, 19, 20, 21, 22, 23, 29, 30, 31, 36, 37, 38, 41, 43, 46, 47, 50, 52, 53
Level 3 (Lowest):	3, 5, 8, 13, 15, 18, 24, 25, 26, 28, 32, 34, 35, 40, 42, 48, 49, 51, 54
COMMENTS	
<p>Well-being Level 1 In this group, the majority of the people own livestock of around 10 to 20 and sometimes even more. They also have large fields of about 4 – 5 hectors that they cultivate because they have enough ploughs and oxen to use during farming. When crops fail as a result of floods or droughts they can easily sell their livestock to earn an income and still lead normal lives because they have alternative forms of livelihoods.</p>	
<p>Well-being Level 2 The majority of the people in this group are fishermen. They also engage in farming activities though to a smaller scale compared to the people in group 1. They own 1 or 2 cattle and hence cannot rely on their cattle for proper cultivation. They often hire oxen from people with a lot of cattle to farm in their lands. They can afford to hire oxen from households that have a lot of cattle because they sale fish which gives them an income. Those that own bigger farms still lack farming implements and oxen so they still hire from the people in the highest level of well-being. Despite owning bigger pieces of land, they are however limited on how much cultivation they can do because payments for use of oxen is charged according to the</p>	

size of the land. Money earned from fish sales is not sufficient to cover big pieces of land. When there is crop failure as a result of flood and drought, they only have fishing and day labour (day labour) as alternative forms of income. They cannot sell cattle to earn income because of the limited number of cattle they have. They however sell chickens, though the earnings from chickens are very small.

Well-being Level 3

This group faces a lot of challenges. Some of them do not have farms to cultivate where as others have very small pieces of land of about ½ hectars to do their farming. The majority cannot afford to buy fishing nets. Some of the people in this group are elderly people who have no one to look after them. The elderly people normally suffer a lot because they also fail to cultivate their lands to have enough for eating throughout the year. Even catching fish in the rivers is not something they can do due to their age hence; they are the most vulnerable in society. They however depend on hand-outs from neighbours and well-wishers to survive.

INFORMANT 3	
Informant:	SILILO KAMBOLE
Sex:	MALE
Age:	39
Neighbourhood:	SIKUZU
Assistant:	MUNALULA LIBUWE
Date:	13/04/2014
Level 1 (Richest):	1, 4, 6, 7, 8, 9, 10, 13, 16, 17, 29, 30, 31, 32, 36, 37, 38, 39, 40, 43, 44, 49, 53, 55, 56
Level 2 (Medium):	11, 22, 23, 26, 27, 41, 42, 45, 47, 48, 51, 52, 54, 57
Level 3 (Lowest):	2, 3, 5, 12, 14, 15, 18, 19, 20, 21, 24, 25, 28, 33, 34, 35, 46, 50
COMMENTS	

<p>Well-being Level 1</p> <p>People in this group own more than 20 cattle. They are also big farmers cultivating land of about 5 hectares using their oxen. Their land is sometimes 3 times bigger than those in the middle class group. Some of them are big fishermen owning a lot of nets and employ a lot of people to catch fish and sale on their behalf.</p> <p>Well-being Level 2</p> <p>People in this group sometimes get a bit of money from their relatives to help them in their daily lives. They also own farms of moderate size such as 1 – 1 ½ hectares which they cultivate. They are also small fishermen owning a few nets. During farming seasons, they hire oxen from those with a lot to cultivate their land. However, they own small livestock like pigs and goats.</p> <p>Well-being Level 3</p> <p>Some of the people in this group cultivate their land of about ½ acres to do farming on a very small scale. They do not own any cattle and cannot afford to hire oxen to cultivate. Their farming is done by human labour in tilling the land. Some own single nets for fishing. They also don't own any pigs or goats. However, they have a few chickens of less than 5.</p>
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1.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN SIKUZU COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (4)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Mukelabai Lipelemesi	2	50	2	67	1	33	50
2	Namakau Wino	4	100	2	67	3	100	89
3	Lumba Lipelemesi	3	75	3	100	3	100	92
4	Songiso Kasale	3	75	2	67	1	33	58
5	Boma Beatie	3	75	3	100	3	100	89
6	Bo Simata Mukumba	3	75	2	67	1	33	58
7	Simata Nalisa	1	25	1	33	1	33	30
8	Boma Mukena	2	50	3	100	1	33	61
9	Lubinda Mukena	1	25	1	33	1	33	30
10	Moses Siloka	2	50	1	33	1	33	39

11	Kweeleka Makuyu	2	50	1	33	2	67	50
12	Lumba Makuyu	2	50	2	67	3	100	72
13	Philip Chikeba	2	50	3	100	1	33	61
14	Liseli Kambole	2	50	1	33	3	100	61
15	Lwindi Kambole	2	50	3	100	3	100	83
16	Sililo Kambole	1	25	1	33	1	33	30
17	Mate Sampaya	1	25	1	33	1	33	30
18	Boleni Lilongwe	4	100	3	100	3	100	100
19	Matokwani Kanyanta	2	50	2	67	3	100	72
20	Matokwani Sampaya	4	100	2	67	3	100	89
21	Namata Mwaala	2	50	2	67	3	100	72
22	Chipo Moyonda	2	50	2	67	2	67	61
23	Kachana Mukena	2	50	2	67	2	67	61
24	Boma Mulela	4	100	3	100	3	100	100
25	Bo Mulela Mukena	3	75	3	100	3	100	92
26	Boma Nyambe	3	75	3	100	2	67	81
27	Likezo Mukena	2	50	1	33	2	67	50
28	Elizabeth Matokwani	4	100	3	100	3	100	100
29	Kamwi Mwilima	2	50	2	67	1	33	50
30	Sampaya Mwilima	2	50	2	67	1	33	50
31	Sindila Sindila	2	50	2	67	1	33	50
32	Mushokabanji Sindila	3	75	3	100	1	33	69
33	Boma Mbanga Mwilima	4	100	1	33	3	100	78
34	George Mulemwa	3	75	3	100	3	100	92
35	Alice Mulemwa	3	75	3	100	3	100	92
36	Mutakela Mutakela	3	75	2	67	1	33	58
37	Muyenga Simata	3	75	2	67	1	33	58
38	Morgan Mutakela	2	50	2	67	1	33	50
39	Bob Mwezeko	2	50	1	33	1	33	39
40	Kalimbi Nyambe	1	25	3	100	1	33	53
41	Liyungu Kakungu	2	50	2	67	2	67	61
42	Monica Makuku	3	75	3	100	2	67	81
43	Makumba	2	50	2	67	1	33	50
44	Mabanganu Mbanga	2	50	1	33	1	33	39
45	Kabuku Songiso	2	50	1	33	2	67	50

46	Boma Lubinda	3	75	2	67	3	100	81
47	Makuyu Sitapata	2	50	2	67	2	67	61
48	Boma Mubita Nyambe	4	100	3	100	2	67	89
49	Boma Kebby Kabika	4	100	3	100	1	33	78
50	Nangula Akamana	2	50	2	67	3	100	72
51	Boma Makuyu Liswaniso	4	100	3	100	2	67	89
52	Inonge Songiso	3	75	2	67	2	67	70
53	Sibeso Kasale	4	100	2	67	1	33	67
54	Matengu Matokwani	3	75	3	100	2	67	81
55	PS Sampaya	1	25	1	33	1	33	30
56	Godwin Mukumba	1	25	1	33	1	33	30
57	Boma Likando	4	100	1	33	2	67	67

1.3 RANK ORDER OF THE HOUSEHOLD IN SIKUZU COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	30	7
2	30	9
3	30	16
4	30	17
5	30	55
6	30	56
7	39	10
8	39	39
9	39	44
10	50	1
11	50	11
12	50	27
13	50	29
14	50	30
15	50	31
16	50	38
17	50	43
18	50	45

19	53	40
20	58	4
21	58	6
22	58	36
23	58	37
24	61	8
25	61	13
26	61	14
27	61	22
28	61	23
29	61	41
30	61	47
31	67	53
32	67	57
33	69	32
34	70	52
35	72	12
36	72	19
37	72	21
38	72	50
39	79	33
40	79	49
41	81	26
42	81	42
43	81	46
44	81	54
45	83	15
46	89	2
47	89	5
48	89	20
49	89	48
50	89	51
51	92	3
52	92	25
53	92	34
54	92	35

55	100	18
56	100	24
57	100	28

2. WEALTH RANKING IN SOOKA COMMUNITY

2.1 RECORDING RESPONSES OF WEALTH RANKINGS IN SOOKA COMMUNITY

INFORMANT 1	
Informant:	KEKELWA SIKUTE
Sex:	MALE
Age:	37
Neighbourhood:	SOOKA
Assistant:	MUNALULA LIBUWE
Date:	14/04/2014
Level 1 (Richest) :	1, 2, 4, 5, 48
Level 2: (Upper middle)	10, 15, 16, 19, 20, 22, 23, 24, 25, 38, 41, 42, 44, 45, 46
Level 3: (Lower middle)	14, 17, 27, 32, 33, 34, 35, 36, 37, 40, 47, 52
Level 4 (Poorest):	54, 49, 50, 51, 43, 39, 28, 29, 30, 31, 26, 21, 18, 11,12, 13, 6, 7, 8, 9, 3
COMMENTS	
Well-being Level 1	

People in this group own cattle of around 10 and above. They also farm their land of about 6 hectares using their own oxen. Some own vehicles that are used as public transport facilities. Others still own grinding mills used for business purposes. Others own small shops where as others are employed at a local lodge as hostesses where they earn monthly incomes.

Well-being Level 2

Some of the people in this group are employed at the local lodge as cooks and guards. They also own cattle of around 5 to 6. Some are farmers cultivating land of around 2 to 3 hectares. Some are fishermen owning around 2 to 3 fishing nets. They can afford to hire people to catch and sale fish on their behalf.

Well-being Level 3

Most people in this group do not own cattle. A few women own 1 or 2 pigs. They own farm lands of around 1 to 2 hectares where they grow food crops. Their farming is done by hiring oxen from fellow community members who own cattle. They also do not own any farming implements. The farming implements they use to cultivate their land are also hired locally. Some of the women in this group are cleaners and/or employed as general workers at the local lodge. The men are small time fishermen owning just one fishing net or borrow fishing nets from others to use. They also own small gardens in which they grow vegetables for sale.

Well-being Level 4

Most of the people in group 4 survive by working in other people’s fields. Some are elderly people who cannot manage to work for themselves. Some are disabled. They do not own any livestock and only have small fields of around ½ hectares.

Additional comments

Those with cattle sell their cattle to earn incomes that can be used to buy maize when crops fail as a result of drought condition or floods. Those that work at the lodge will rely on their salaries from the lodge to buy food. Others still sale the livestock they own.

The poorest people are sometimes helped by other family members not residing within the communities. E.g. they may be helped by their children who work in town. Better still, others work day labour to survive where as others sell vegetables and gather firewood for sale.

INFORMANT 2	
Informant:	SIKUTE MUHAMUBI
Sex:	MALE
Age:	28

Neighbourhood:	SOOKA
Assistant:	MUNALULA LIBUWE
Date:	14/04/2014
Level 1 (Richest):	1, 4, 5, 16, 24, 25, 36, 38, 41, 42, 48
Level 2 (Upper middle):	10, 13, 14, 15, 23, 39, 45, 46, 49, 52
Level 3 (Lower middle)	2, 3, 9, 17, 18, 19, 20, 22, 26, 27, 32, 37, 40, 43, 44, 47, 50, 51, 53
Level 3 (Poorest):	6, 7, 8, 11, 12, 21, 28, 29, 30, 31, 33, 34, 35
COMMENTS	
<p>Well-being Level 1 People in this group own more than 10 cattle. They also farm their land using their own oxen. Their farms are around 6 hectares. Their houses are roofed with iron sheets. A few people within the group own vehicles and earn extra income from transporting people to town and transporting goods for other people. Better still, others own shops and earn extra incomes from sells made from their shops.</p> <p>Well-being Level 2 People in this group own smaller land compared to those in group one. Their land is roughly around 3 hectares. They also own cattle but have very few of around 3 to 5. Some also own small livestock like goats and pigs. Others work at a local lodge as guards and cooks.</p> <p>Well-being Level 3 The majority of people in this group are fishermen owning about 2 to 3 fishing nets. They also own vegetable gardens and own land used for maize production of around 1 hectare. To cultivate their fields, they have to hire oxen from those that own cattle as they do not have any.</p> <p>Well-being Level 4 These are the poorest of the community who do not own any livestock or farming implements. They depend on other people who own land to be given small pieces of land to cultivate. The small pieces of land are cultivated using hoes. Sometimes, they work in other people's fields to get access to small pieces of land for farming and to use oxen owned by those that have. Some of the people in this group are aged people who cannot work but depend on others for hand-outs.</p>	

INFORMANT 3	
Informant:	NAMASIKU PUMULO
Sex:	FEMALE
Age:	38
Neighbourhood:	SOOKA
Assistant:	MUNALULA LIBUWE
Date:	14/04/2014
Level 1 (Richest):	1, 4, 5, 16, 24, 38, 41, 42, 48
Level 2 (Upper middle):	2, 6, 10, 15, 17, 18, 19, 20, 23, 25, 36, 45, 46
Level 3 (Lower middle)	3, 7, 13, 22, 32, 33, 37, 39, 44, 49, 52, 53
Level 4 (Lowest):	8, 9, 11, 12, 14, 21, 26, 27, 28, 29, 30, 31, 34, 35, 40, 43, 47, 50, 51
COMMENTS	
<p>Well-being Level 1 People in this group own cattle of about 10 or more. They farm land of about 6 hectares. They also own houses roofed with iron sheets. Some are shop owners and some own vehicles used for business and personal uses. Equally, some are fishermen owning 3 to 5 fishing nets. Yet still, others own a lot of chickens and pigs.</p> <p>Well-being Level 2 The majority of the people in this group own about 2 to 3 hectares of land used for farming. They also own cattle of around 5. Some are also fishermen and they also own chickens and goats.</p> <p>Well-being Level 3 People in this group own 1 or 2 cattle. They farm small pieces of land of around ½ hectares. Some work at the lodge as general workers. They also own few chickens and no goats.</p> <p>Well-being Level 4</p>	

People in this group do not own any cattle. They work in other people's fields with oxen so that they can use their oxen in return. They also do day labour to earn an income. Some are also fishermen who catch fish using borrowed nets. Sometimes, they catch fish for people that have nets so that they can be allowed to use their fishing nets in return.

2.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN SOOKA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	AVERAGE SCORE
1	Simata Mwiya	1	25	1	25	1	25	25
2	Sikute Muhambi	1	25	3	75	2	50	50
3	Sililo Muhambi	4	100	3	75	3	75	83
4	Ilubonda Nganga	1	25	1	25	1	25	25
5	Muhamubi Sikute	1	25	1	25	1	25	25
6	Mwilimwa Mutemwa	4	100	4	100	2	50	83
7	Nasilele Simbala	4	100	4	100	3	75	92
8	Kekelwa Sikute	4	100	4	100	4	100	100
9	Chaze Sikute	4	100	3	75	4	100	92
10	Nunsa Mundia	2	50	2	50	2	50	50
11	Liyali Batunda	4	100	4	100	4	100	100
12	Wamulume Batunda	4	100	4	100	4	100	100
13	Sikute Musweu	4	100	2	50	3	75	75
14	Lukwakwa Sikute	3	75	2	50	4	100	75
15	Sikute Sikute Snr	2	50	2	50	2	50	50
16	Samuel Sikute	2	50	1	25	1	25	33
17	Mwilima Samuel	3	75	3	75	2	50	67
18	Muletambo Samuele	4	100	3	75	2	50	75
19	Namukolo Sikute	2	50	3	75	2	50	58
20	Mukwamandi Sikute	2	50	3	75	2	50	58
21	Sikute Sikute Jnr	4	100	4	100	4	100	100
22	Musweu Sikute	2	50	3	75	3	75	67
23	Ben Sikute	2	50	2	50	2	50	50

24	Andrew Sikute	2	50	1	25	1	25	33
25	Charles Sikute	2	50	1	25	2	50	42
26	Mabuka Chali	4	100	3	75	4	100	92
27	Mulela Chali	3	75	3	75	4	100	83
28	Mate Mukelabai	4	100	4	100	4	100	100
29	Kaunda Simasiku	4	100	4	100	4	100	100
30	Monde Mate	4	100	4	100	4	100	100
31	Liswaniso Siyanga	4	100	4	100	4	100	100
32	Reuben Simasiku Snr	3	75	3	75	3	75	75
33	Sibungo Simasiku	3	75	4	100	3	75	83
34	Nawa Simasiku Snr	3	75	4	100	4	100	92
35	Kamwi Simasiku	3	75	4	100	4	100	92
36	Kamwi Kekelwa	3	75	1	25	2	50	50
37	Masule Kekelwa	3	75	3	75	3	75	75
38	Mwilima Kekelwa	2	50	1	25	1	25	33
39	Kasani Kekelwa	4	100	2	50	3	75	75
40	Samaliba Masule	3	75	3	75	4	100	83
41	Masule Kekelwa	2	50	1	25	1	25	33
42	Sianga Kasungo	2	50	1	25	1	25	33
43	Sampaya Sampaya	4	100	3	75	4	100	92
44	Masule Sampaya	2	50	3	75	3	75	67
45	Kabuku Sampaya	2	50	2	50	2	50	50
46	Nzwa Sampaya	2	50	2	50	2	50	50
47	Mwezi Masule	3	75	3	75	4	100	83
48	Kekelwa Sampaya	1	25	1	25	1	25	25
49	Mwangala Nyambe	4	100	2	50	3	75	75
50	Yvonne Nyambe	4	100	3	75	4	100	92
51	Liwali Litiya	4	100	3	75	4	100	92
52	Mazila Mazila	3	75	2	50	3	75	67
53	Byemba Byemba	4	100	3	75	3	75	83

2.3 RANK ORDER OF THE HOUSEHOLD IN SOOKA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
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1	25	1
2	25	4
3	25	5
4	25	48
5	33	16
6	33	24
7	33	38
8	33	41
9	33	42
10	42	25
11	50	2
12	50	10
13	50	15
14	50	25
15	50	36
16	50	45
17	50	46
18	58	19
19	58	20
20	67	17
21	67	22
22	67	44
23	67	52
24	75	13
25	75	14
26	75	18
27	75	32
28	75	37
29	75	39
30	75	49
31	83	3
32	83	6
33	83	27
34	83	33
35	83	40
36	83	47

37	83	53
38	92	7
39	92	9
40	92	26
41	92	34
42	92	35
43	92	43
44	92	50
45	92	51
46	100	8
47	100	11
48	100	12
49	100	21
50	100	28
51	100	29
52	100	30
53	100	31

3. WEALTH RANKING IN MUTETO COMMUNITY

3.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MUTETO COMMUNITY

INFORMANT 1	
Informant:	CHARITY MULEZA
Sex:	FEMALE
Age:	50
Neighbourhood:	MUTETO
Assistant:	MASIYE NSONGA

Date:	23/05/2015
Level 1 (Richest) :	13, 14, 19, 20, 25, 26
Level 2: (Upper middle)	8, 11, 12, 24
Level 3: (Lower middle)	9, 18, 21, 22, 23
Level 4 (Poorest):	1, 2, 3, 4, 5, 6, 7, 10, 15, 16, 17
COMMENTS	
<p>Well-being Level 1 They have lots of cattle. Have lots of good progressive ideas on business ventures that are productive. They make a lot of money from the sales of cattle and milk. They also hire out their animals to those who do not have to be use in ploughing the fields. This makes them earn extra than the rest of the people in the area. They have big fields of maize and cotton that they sale in town after harvest so they generally have more than enough. Maize grown is sufficient to feed their families throughout the year and the surplus is sold out. They also grow beans and sweet potatoes for home consumption and sale the surplus.</p> <p>Well-being Level 2 They engage in all business ventures they can get their hands on. However, the most prominent business they engage in is the buying of livestock – Chickens, pigs, goats from those who have a lot locally and resale in town at higher prices. Profit margins from the sales of livestock is only enough to keep them going, it's not much to enjoy a good life as compared to the people in level one. These people don't depend on hand outs from other people because they also labor in their gardens to grow vegetables to sale locally when livestock businesses are not doing well. Their fields are not very big because they have limited inputs like fertilizers and livestock manure because they don't own their own cattle for field nutrients and they always hire livestock to cultivate their fields because they don't own any.</p> <p>Well-being Level 3 They labor in other people's fields as payment for use of livestock to cultivate their own fields. Sometimes, they labor for money and feed from the money they labor for. Their maize fields don't yield enough to last the whole year because they spend most of the food production time working in other people's fields neglecting their own fields. They don't have inputs like fertilizers and no one wants to loan them any money for fear of defaulting to pay back because they are poor and field produce is poor.</p> <p>Well-being Level 4</p>	

These are very poor. They accept and beg for handouts from anyone. They have no livestock of their own; they even don't do any business of any nature because most of them are old and live alone with no children to help them. They don't produce any food and don't use their fields to grow anything in it.

INFORMANT 2	
Informant:	OPA MPOFU
Sex:	FEMALE
Age:	29
Neighbourhood:	MUTETO
Assistant:	MASIYE NSONGA
Date:	23/05/2015
Level 1 (Richest):	8, 13, 14, 19, 20, 21, 24, 25, 26
Level 2 (Upper Middle)	7, 12
Level 3 (Lower Middle):	1, 9, 10, 11, 15, 22, 23
Level 4 (Poorest):	2, 3, 4, 5, 6, 16, 17, 18
COMMENTS	
<p>Well-being Level 1 They are rich in the village. They are able to solve any problem that befell their families because they can easily sale the animals they have and use the money to purchase what they don't have. In times of floods or droughts, they do not suffer like the rest of the villagers because their animals would be sold and money used to buy maize for consumption. Some still have maize in their storages from the previous farming season. They manage to cultivate their fields properly and yield lots of food because they don't incur costs of hiring livestock because they own livestock</p>	

Well-being Level 2

They live better than people in group three, but not as well as those in level one. They have capital to start businesses. Those who lack make building blocks for sale. They also buy livestock – Chickens, pigs and goats locally and resale it in Livingstone, while some of it is sold locally. Their fields are cultivated by hiring farming equipment from those who have. They also hire oxen to plough their fields. They are not rich but also not poor because their families are sustained throughout the year from the businesses they engage in.

Well-being Level 3

These are poor who depend on neighbors and well-wishers for survival. They don't cultivate and grow maize in their fields because they are old and don't have anyone to take care of them. Sometimes, village people and relatives cultivate these people's fields at no cost; just to enable them have something to eat for a few months. They don't own anything and their houses are in deplorable conditions mainly made of mud and logs. Their property is a few plate and old worn out clothes.

Well-being Level 4

These are the poorest in the society who fail to sustain themselves through any means. They depend on others for food and clothing and may go for days without food if no one comes to their aid

INFORMANT 3	
Informant:	TRUST SHATAMA
Sex:	MALE
Age:	43
Neighbourhood:	MUTETO
Assistant:	MASIYE NSONGA
Date:	23/05/2015

Level 1 (Richest):	8, 13, 19, 20, 24, 26
Level 2 (Upper middle):	2, 9, 10, 12, 14, 21, 25
Level 3 (Lower middle)	1, 3, 7, 11, 18, 22
Level 4 (Lowest):	4, 5, 6, 15, 16, 17, 23
COMMENTS	
<p>Well-being Level 1 They own cattle and have personal ploughs. They have enough to eat and the surplus for sale. In times of drought or flooding, they still don't go hungry because they can sale livestock from their kraals and still buy food to eat. They hire out their animals to cultivate other people's fields.</p> <p>Well-being Level 2 They have capital to invest in businesses. They buy fish from fishermen and resale it within their villages. Those who realize a lot of profit from fish sales invest in livestock business. They buy chickens, goats and pigs locally and resale it in towns at higher prices. They hire animals from those who have to cultivate their fields. Their fields are not very big because paying for the use of oxen to cultivate large fields is very expensive. In good harvest years, they don't run short of food for the entire year.</p> <p>Well-being Level 3 These are the unmarried women who beg from cattle owners to use their animals to cultivate their fields. They run small businesses selling cooked groundnuts and fritters and live on labouring in other people's fields to earn money. Their fields are not big because their households are small. They grow vegetables that they sale door to door locally.</p> <p>Well-being Level 4 These are old and sickly people who have nothing to eat. They don't own any property except for small mats in their houses where they sleep. They don't have any cattle and do no farming. These do not engage in any business ventures because they have no capital to invest and do not have the strength to work.</p>	

3.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN MUTETO COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant
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		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	AVERAGE SCORE
1	Mwitumwa Mwitumwa	4	100	3	75	3	75	83
2	Kalaba Sekela	4	100	4	100	2	50	83
3	Innocent Shatama	4	100	4	100	3	75	92
4	Inambo Simbole	4	100	4	100	4	100	100
5	Maggie Siantumbu	4	100	4	100	4	100	100
6	Monde Mulimu	4	100	4	100	4	100	100
7	Florence Chizhuka	4	100	2	50	3	75	75
8	Opa Mpofu	2	50	1	25	1	25	33
9	Recta Munaluna	3	75	3	75	2	50	67
10	Twaambo Monde	4	100	3	75	2	50	75
11	Kakwambala Silute	2	50	3	75	3	75	67
12	Taliard Kadyanta	2	50	2	50	2	50	50
13	Albert Siachinji	1	25	1	25	1	25	25
14	Rice Shakalibwe	1	25	1	25	2	50	33
15	Monde Siakatamba	4	100	3	75	4	100	92
16	Munalula Sikute	4	100	4	100	4	100	100
17	Mwembe Mwembe	4	100	4	100	4	100	100
18	Mervice Shatama	3	75	4	100	3	75	83
19	Harry Shikaaba	1	25	1	25	1	25	25
20	Mundia Lweya	1	25	1	25	1	25	25
21	Prudence Halubobya	3	75	1	25	2	50	50
22	Trust Shatama	3	75	3	75	3	75	75
23	Siulapwa Siulapwa	3	75	3	75	4	100	83
24	Eunice Shibanda	2	50	1	25	1	25	33
25	Mwakateu Shibanda	1	25	1	25	2	50	33
26	Charity Muleza	1	25	1	25	1	25	25

3.3 RANK ORDER OF THE HOUSEHOLD IN MUTETO COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	25	13
2	25	19

3	25	20
4	25	26
5	33	8
6	33	14
7	33	24
8	33	25
9	50	12
10	50	21
11	67	9
12	67	11
13	75	7
14	75	10
15	75	22
16	83	1
17	83	2
18	83	18
19	83	23
20	92	3
21	92	15
22	100	4
23	100	5
24	100	6
25	100	16
26	100	17

4. WEALTH RANKING IN NAMANGU COMMUNITY

4.1 RECORDING RESPONSES OF WEALTH RANKINGS IN NAMANGU COMMUNITY

INFORMANT 1

Informant:	PEGGY NUMBA SEZUNI
Sex:	FEMALE
Age:	43
Neighbourhood:	NAMANGU
Assistant:	MUNALULA LIBUWE
Date:	15/04/2014
Level 1 (Richest) :	3, 5, 18, 26, 33, 37, 41, 52, 55, 57
Level 2: (Upper middle)	1, 4, 6, 7, 8, 9, 13, 14, 19, 22, 23, 24, 27, 32, 34, 36, 39, 50, 59, 60
Level 3: (Lower middle)	2, 10, 12, 15, 16, 17, 20, 21, 25, 28, 29, 30, 35, 42, 46, 47, 51, 53, 58
Level 4 (Poorest):	11, 31, 38, 40, 43, 44, 45, 48, 49, 54, 56, 61
COMMENTS	
<p>Well-being Level 1 Some people in this group own big houses where as others own shops which help them earn extra incomes. They also own farms of round 10 hectors and own their own oxen used to plough their land and sometimes hire labourers to work in their fields. They also own farming implements such as ploughs and rippers. Their heads of cattle are around 10 to 20. The majority of the people in this group have their houses roofed with iron sheets. They also own a lot of goats and chickens. Some also own solar panels, television sets and radios.</p>	
<p>Well-being Level 2 People in this group own cattle of around 8 or less. Some of their oxen are used for farming but they do not own farming implements. They borrow or hire farming implements from people in the first level of well-being. They also own land which is quiet big because they can afford to hire implements from people that own farming implements. They too own goats, pigs and a lot of chickens. A few of the people in this group have roofed their houses with iron sheets. Some also own television sets and radios that run on battery power.</p>	
<p>Well-being Level 3 The majority of the people in this group are fishermen. Some of the people in the group own small pieces of land of around 1 hector which they cultivate using borrowed farming implements. Some of the women in the group are small traders of fish and brew beer for sale. They also own a few goats, pigs and chickens and no cattle. A few of them own small radios but none own television sets.</p>	

Well-being Level 4

The women in this group are small fish traders but do not earn enough money from their fish businesses. Their earnings are only sufficient to feed their households on some days while other days, they work as labourers in other people's fields or homes to earn an income. Yet still, others depend on relations to assist them have food while others depend on community handouts. They do not own any cattle, pigs or goats. However, they own few chickens.

INFORMANT 2	
Informant:	NAWANDA KAWANGA
Sex:	FEMALE
Age:	41
Neighbourhood:	NAMANGU
Assistant:	MUNALULA LIBUWE
Date:	15/04/2014
Level 1 (Richest):	9, 13, 20, 25, 50, 52, 55, 58
Level 2 (Upper middle):	3, 4, 5, 8, 11, 18, 21, 26, 27, 28, 31, 35, 41, 53, 54, 57, 61
Level 3 (Lower middle)	10, 12, 14, 15, 19, 23, 24, 29, 33, 34, 36, 37, 39, 40, 43, 45, 46, 47, 48, 49, 56, 60
Level 4 (Lowest):	1, 2, 6, 7, 16, 17, 22, 30, 32, 38, 42, 44, 51, 59
COMMENTS	
Well-being Level 1	

People in this level own more than 10 cattle. Some also own shops. They are also farmers owning farm lands of around 10 hectares. They also own a lot of pigs and goats as well as chickens. Their houses are big and roofed with iron sheets. The majority own bicycles, television sets and radio sets. Others also own solar panels and batteries used to run their electric appliances.

Well-being Level 2

People in this group own land of around 6 hectares and own cattle amounting to around 5. Their houses are medium sized and have iron sheets. They also own a lot of chickens and a few pigs and goats. Some also own radios, smaller television sets and bicycles.

Well-being Level 3

People in this group live in thatched houses. Their houses are much smaller than those owned by people in level one and two. Their farm lands are around 1 to 2 hectares. They do not own farming implements such as ploughs and their farming is done using hand hoes. Some are also fishermen where as others engage in the buying and selling of fish. They own few goats, pigs and chickens. They neither own any television sets nor do they own radios.

Well-being Level 4

People in this level survive on day labour. They labour in other people's fields to earn little incomes. Some of the people in this group burn and sell charcoal. They also farm small pieces of land of around ½ hectares. They do not own any cattle, pigs or goats. However, they own few chickens.

INFORMANT 3	
Informant:	CHRISTOPHER WAKUMELO
Sex:	MALE
Age:	50
Neighbourhood:	NAMANGU
Assistant:	MUNALULA LIBUWE
Date:	15/04/2014

Level 1 (Richest):	3, 5, 18, 26, 33, 41, 52
Level 2 (Upper middle):	1, 4, 6, 8, 9, 14, 16, 22, 23, 25, 28, 34, 36, 37, 39, 50, 55, 57, 59, 60
Level 3 (Lower middle)	2, 7, 10, 12, 13, 15, 17, 19, 20, 21, 24, 27, 29, 30, 32, 35, 42, 43, 45, 46, 47, 48, 53, 54, 56, 58, 61
Level 4 (Lowest):	11, 31, 38, 40, 44, 49, 51
COMMENTS	
<p>Well-being Level 1 Some people in this group own shops and cattle of over 15. They also own and farm their land of around 10 hectares. They also own farming implements such as ploughs. They farm their land using their own oxen. Their houses are big and roofed with iron sheets. They also own a lot of goats, pigs and chickens. They also own radios, television sets and bicycles.</p> <p>Well-being Level 2 They own and farm land of around 6 to 8 hectares. They own 3 to 4 herds of cattle. Those that do not own any oxen use hired oxen to plough their fields from people that own oxen. They can also afford to hire labourers to work in their fields. Some live in small houses roofed with iron sheets while others live in thatched houses.</p> <p>Well-being Level 3 People in this level own farm lands of around 1 to 2 hectares. They do not own any cattle. They also live in thatched houses. Very few people in the group own goats and chickens. None of the group members own pigs. Equally very few group members own small radios. None of the group members own bicycles.</p> <p>Well-being Level 4 Some people in this group are elderly people who can hardly manage to do any work. They entirely depend on hand outs. Some households in this group are child headed households where as other homes are headed by widows. The child headed households depend on hand outs and day labour to survive. They labour in other people's fields for meals and small wages.</p>	

4.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN NAMANGU COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant
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		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	AVERAGE SCORE
1	Nyambe Moowa	2	50	4	100	2	50	67
2	Sibusiku Kayama	3	75	4	100	3	75	83
3	Chripine Wakumelo	1	25	2	50	1	25	33
4	Martin Mutengo	2	50	2	50	2	50	50
5	Mwane Ishuwa	1	25	2	50	1	25	33
6	Shadrek Akatama	2	50	4	100	2	50	67
7	Sitali Kayawe	2	50	4	100	3	75	75
8	Akatekelwa Samwezi	2	50	2	50	2	50	50
9	Samwezi Samwezi	2	50	1	25	2	50	42
10	Jacob Kapokola	3	75	3	75	3	75	75
11	Kuliwa Mutonga	4	100	2	50	4	100	83
12	Akabondo Matengu	3	75	3	75	3	75	75
13	Namasiku Siisi	2	50	1	25	3	75	50
14	Mubita Imasiku	2	50	3	75	2	50	58
15	Maureen Sitwala	3	75	3	75	3	75	75
16	Maketo Mate	3	75	4	100	2	50	75
17	Danny Silango	3	75	4	100	3	75	83
18	Mafwila Mafwila	1	25	2	50	1	25	33
19	Kamwi Sikango	2	50	3	75	3	75	67
20	Namatama Mutonga	3	75	1	25	3	75	58
21	Grace Namatama Mashi	3	75	2	50	3	75	67
22	Amukusana Namafuka	2	50	4	100	2	50	67
23	Christopher Mukata	2	50	3	75	2	50	58
24	Ikume Munyaza	2	50	3	75	3	75	67
25	Lifasa Samuzila	3	75	1	25	2	50	50
26	Kapelwa Mukata	1	25	2	50	1	25	33
27	Liswaniso Mafwila	2	50	2	50	3	75	58
28	Mary Mate	3	75	2	50	2	50	58
29	Mbaita Mwanga	3	75	3	75	3	75	75
30	Nasilele Sankombo	3	75	4	100	3	75	83
31	Nalishebo Kaumba	4	100	2	50	4	100	83
32	Mwaka Siboleka	2	50	4	100	3	75	75
33	Kashweka Kamenga	1	25	3	75	1	25	42
34	Twaambo Mukata	2	50	3	75	2	50	58

35	Sikopo Wamulume	3	75	2	50	3	75	67
36	Mooka Mbangweta	2	50	3	75	2	50	58
37	Kalowa Kalowa	1	25	3	75	2	50	50
38	Joyce Nasilele Nyambe	4	100	4	100	4	100	100
39	Ilukena Mukata	2	50	3	75	2	25	50
40	Monde Mukena	4	100	3	75	4	100	92
41	Shadrek Mulombwe	1	25	2	50	1	25	33
42	Pelekelo Samuzila	3	75	4	100	3	75	83
43	Kayimba Siyanga	4	100	3	75	3	75	83
44	Maanga Kamwi	4	100	4	75	4	100	92
45	Namata Mwiba	4	100	3	75	3	75	83
46	Chuma Nyambe	3	75	3	75	3	75	75
47	Simbuwa Muyunda	3	75	3	75	3	75	75
48	Lumba Samwezi	4	100	3	75	3	75	83
49	Biemba Matale Mbanga	4	100	3	75	4	100	92
50	Theresa Liwale	2	50	1	25	2	50	42
51	Inonge Sanyambe Sitela	3	75	4	100	4	100	92
52	Nenga Mutafela	1	25	1	25	1	25	25
53	Mulela Mutafela	3	75	2	50	3	75	67
54	Lineti Sililo Mulwazi	4	100	2	50	3	75	75
55	Mbangweta Akaliwa	1	25	1	25	2	50	33
56	Simbi Sianga	4	100	3	75	3	75	83
57	Liwena Dambe	1	25	2	50	2	50	42
58	Boma Kambungo	3	75	1	25	3	75	58
59	Florence Kalaluka Chuma	2	50	4	100	2	50	67
60	Kalenga Mbangweta	2	50	3	75	2	50	58
61	Nchindo Samuzila	4	100	2	25	3	75	67

4.3 RANK ORDER OF THE HOUSEHOLD IN NAMANGU COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	25	52
2	33	3
3	33	5

4	33	26
5	33	41
6	33	55
7	33	18
8	42	9
9	42	33
10	42	50
11	42	57
12	50	4
13	50	8
14	50	13
15	50	25
16	50	37
17	50	39
18	58	14
19	58	20
20	58	23
21	58	27
22	58	28
23	58	34
24	58	36
25	58	58
26	58	60
27	67	1
28	67	6
29	67	19
30	67	21
31	67	22
32	67	24
33	67	35
34	67	53
35	67	59
36	67	61
37	75	7
38	75	10
39	75	12

40	75	15
41	75	16
42	75	29
43	75	32
44	75	46
45	75	47
46	75	54
47	83	2
48	83	11
49	83	17
50	83	30
51	83	31
52	83	42
53	83	43
54	83	45
55	83	48
56	83	56
57	92	40
58	92	44
59	92	49
60	92	51
61	100	38

5. WEALTH RANKING IN NGALATA COMMUNITY

5.1 RECORDING RESPONSES OF WEALTH RANKINGS IN NGALATA COMMUNITY

INFORMANT 1	
Informant:	MUNALULA MATE
Sex:	MALE

Age:	43
Neighbourhood:	NGALATA
Assistant:	MASIYE NSONGA
Date:	25/05/2015
Level 1 (Richest) :	2, 3, 15
Level 2: (Upper middle)	4, 5, 6, 9, 11, 13, 18, 19, 26, 30
Level 3: (Lower middle)	1, 8, 10, 12, 14, 16, 20, 24, 27
Level 4 (Poorest):	7, 17, 21, 22, 23, 25, 28, 29
COMMENTS	
<p>Well-being Level 1 They have cattle, pigs, goats and chickens and live better than the rest of the community. Their livestock is sold in town and some of it is sold locally. They also milk their cows and sale the milk locally. That is why they manage to eat well than any other members in the community with 3 meals a day because they have a lot of money. They don't have difficulties in farming because they have a lot of farming implements. They also pay laborers to weed their big fields. Because of good farming implements, money and cattle they have, they are able to cultivate big fields with ease. Some own businesses like running hummer mills while others own vehicles used as transport maize and livestock to town for traders. They also have electricity in their houses which are made of concrete.</p> <p>Well-being Level 2 They work in their fields. They have medium sized fields that are sufficient to grow maize enough for household consumption. They don't sale farm produce because they usually don't have surpluses for sale. They don't own any cattle. However, from time to time, relatives give them oxen to use in ploughing their fields; hence they would cultivate big pieces of land and yield more than enough for home consumption. They just own few pigs, a good numbers of chickens and goats. They don't run any major businesses but some trade in fresh and sour milk, just to have a bit of money for their pockets and emergencies. Though their livelihood can not be compared to that of people in the above level, they actually don't live badly.</p> <p>Well-being Level 3 They own very small pieces of land where they cultivate very little maize which does not yield enough crops to last the whole year. They don't own any cattle or farming implements. They labor in other people's fields to earn money. Others go round door to door in other people's houses doing house work and are given maize that they take home to eat. Their livelihoods are not good. Sometimes they go to the river to catch fish that they eat at home. When they have caught more than they can eat, they sale the surplus locally.</p>	

Well-being Level 4

They are the poorest of the community. Most of them are single mothers and irresponsible men/women. They like to beg for food from neighbors because they don't like working for themselves. They own small pieces of land but rarely use them to grow anything because they are lazy and are used to handouts. They don't have plans for the future and don't engage in any business activities. They have few chicken, no goats and pigs because they have sold them and misused the proceeds without any thought of reinvesting it into something profitable.

INFORMANT 2	
Informant:	MUBONDA MUBONDA
Sex:	MALE
Age:	41
Neighbourhood:	NGATATA
Assistant:	MASIYE NSONGA
Date:	25/05/2015
Level 1 (Richest):	6, 12, 14, 26
Level 2 (Upper middle):	2, 3, 5, 7, 15, 16, 17, 20, 28
Level 3 (Lower middle)	8, 9, 11, 13, 19, 22, 23, 24, 25, 29
Level 4 (Lowest):	1, 4, 10, 18, 21, 27, 30
COMMENTS	
<p>Well-being Level 1 They manage to work very well in their fields because they have a lot of oxen and ploughs to do the job. They live well with good decent meals every day. They have never slept hungry because they yield a lot of maize from their farms. They own big pieces of land and utilization of land is complete. They grow beans, maize, cotton and groundnuts, enough for sale and home consumption throughout the year. They prioritize children education and their children attain good education. Some even go to university and college level.</p>	

Well-being Level 2

They work for themselves to earn a living. They also live well but cannot be compared to those in level 1. They own big fields but don't use it all to cultivate crops because they don't have farming implements. However, they manage to produce food sufficient to last them a few months in a year. These other months, they have to buy maize to eat. They don't depend on other people's help to survive. They always work hard for their food. They don't run any businesses but they have few cattle, pigs, goats and chicken that they can sale in times of food shortages to buy maize for home consumption. They also live better and eat well.

Well-being Level 3

They do their best to live well but because they do not have the capacity, they rarely manage. They don't have any oxen to help them cultivate their fields so their yield is not very good. They don't have money to buy fertilizers, nor do they have manure from livestock to apply in the fields, so they don't do well in food production. However, they engage in many small other businesses like selling baked bread, vegetables and milk both fresh and sour just to keep them going. In any case their small businesses do not yield much to help them send their children to school. Children do attain basic education because it is cheap in villages, but higher education is expensive especially in town. Their eating is not so good because most of the year, they only afford to eat two meals a day or less.

Well-being Level 4

They do not cultivate their fields because they are lazy to work. They have people (friends and relatives) who are willing to allow them use oxen to plough their fields but they don't want to ask because they know that they can still eat without doing any work. They don't run any sorts of businesses and are usually with no money. People usually don't lend them money because they are known to be unproductive. Because they don't produce any crop, they usually don't know what tomorrow holds. They just live for the day and beg for food most the time. People also give them second hand clothes because they dress in torn and old clothes. Children education is not a priority because they don't see the importance of being educated.

INFORMANT 3	
Informant:	LIPALILE MATE
Sex:	MALE
Age:	50
Neighbourhood:	NGALATA
Assistant:	MASIYE NSONGA

Date:	25/05/2015
Level 1 (Richest):	2, 3, 15
Level 2 (Upper middle):	4, 5, 6, 9, 10, 13, 14, 16, 19, 26, 30
Level 3 (Lower middle)	1, 8, 11, 12, 18, 20, 23, 24, 28, 29
Level 4 (Lowest):	7, 17, 21, 22, 25, 27
COMMENTS	
<p>Well-being Level 1 They own their own cattle. Whenever they are faced with a problem like bereavements in the family, they are able to finance funeral costs without expecting help from external people. They have big fields and grow cash crops like cotton, groundnuts and beans. They also grow maize for sale but lots of it is for home consumption. They are well able to buy food in time of crop failure resulting from natural circumstances like flooding and drought because they can sale their livestock and buy maize to eat. Some of them even run hummer mills which earn them extra money so money is not a problem for them. They afford to take children to school, even to attain secondary education within the district and sometimes in town, only that children are dull and don't do well at school, that's why only a few go to college or university.</p> <p>Well-being Level 2 They have the strength to work and work for themselves in the fields to have food for household consumption. They don't yield much more than they can eat because they are limited in labour power and faming implements. They don't own cattle of their own, so they herd relatives' cattle and then are allowed to use it for cultivating fields. However, time to use oxen and ploughs belonging to their relatives is limited because the owners would still want to it in their own big fields. This is why their crop yields are not very big. They do have big pieces of land but don't use it all to grow crops. They produce maize for home consumption and nothing for sale. Their produce only last through a few months and the rest of the months is left to scout for food. Children education is basic with no attainment of secondary education because they don't have lots of money</p> <p>Well-being Level 3 Even though their standard of living is not as good as that of the above levels, they don't sleep hungry. They are able to cut wood for sale locally and burn charcoal that they also sell. Sometimes, they enterprise in small businesses like brewing beer and selling vegetables locally. Children don't go to school because parents don't have money to sponsor them. They have big families while live in small houses made of mud and logs. Their livelihoods are not good because they don't have money and any livestock or property to sale. They just depend on their small businesses for survival.</p> <p>Well-being Level 4 They don't do anything for a living. Their living standards are extremely poor. They move from house to house begging for food and clothing. If they cannot be given food that day, they sleep hungry. Don't have any businesses to rely on for survival because they don't have capital to start with</p>	

and no one is willing to lend them money because they don't pay back. They are lazy that's why they don't cut wood or burn wood to sale so that they can buy food.

5.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN NGALATA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	
1	Akabonda Simushi	3	75	4	100	3	75	83
2	Lipalile Mate	1	25	2	50	1	25	33
3	Kalima Sikute	1	25	2	50	1	25	33
4	Boma Sitali	2	50	4	100	2	50	67
5	Munalula Mate	2	50	2	50	2	50	50
6	Bondate Kelvin	2	50	1	25	2	50	42
7	Sitali Lukena	4	100	2	50	4	100	83
8	Mate Mate	3	75	3	75	3	75	75
9	Ilukena Namushi	2	50	3	75	2	50	58
10	Priscilla Foloshi	3	75	4	100	2	50	75
11	Mwakamui Likando	2	50	3	75	3	75	67
12	Trywell Nsonga	3	75	1	25	3	75	58
13	Nawa Lukena	2	50	3	75	2	50	58
14	Munalula Sililo	3	75	1	25	2	50	50
15	Sanyambe Mukelabai	1	25	2	50	1	25	33
16	Nyambe Bornwell	3	75	2	50	2	50	58
17	Lipalile Simoka	4	100	2	50	4	100	83
18	Mubonda Mubonda	2	50	4	100	3	75	75
19	Simasiku John	2	50	3	75	2	50	58
20	Nawa Simasiku	3	75	2	50	3	75	67
21	Faustina Chiwaile	4	100	4	100	4	100	100
22	Boma Mwiinga	4	100	3	75	4	100	92
23	Imasiku Lukena	4	100	3	75	3	75	83
24	Nalukena Lubonda	3	75	3	75	3	75	75
25	Shalala Simoka	4	100	3	75	4	100	92

26	Chatherine Sililo	2	50	1	25	2	50	42
27	Mubita Kabika	3	75	4	100	4	100	92
28	Mukelabai Mukonde	4	100	2	50	3	75	75
29	Kabika Kabika	4	100	3	75	3	75	83
30	Musabata Linyunga	2	50	4	100	2	50	67

5.3 RANK ORDER OF THE HOUSEHOLD IN NGALATA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	2
2	33	3
3	33	15
4	42	6
5	42	26
6	50	5
7	50	14
8	58	9
9	58	12
10	58	13
11	58	16
12	58	19
13	67	4
14	67	11
15	67	20
16	67	30
17	75	8
18	75	10
19	75	18
20	75	23
21	75	24
22	75	28
23	83	1
24	83	7

25	83	17
26	83	29
27	92	22
28	92	25
29	92	27
30	100	21

6. WEALTH RANKING IN KACHABULA COMMUNITY

6.1 RECORDING RESPONSES OF WEALTH RANKINGS IN KACHABULA COMMUNITY

INFORMANT 1	
Informant:	MODESTER KACHABULA
Sex:	FEMALE
Age:	35
Neighbourhood:	KACHABULA
Assistant:	MASIYE NSONGA
Date:	27/05/2015
Level 1 (Richest) :	2, 9, 19, 28
Level 2: (Upper middle)	1, 10, 11, 12, 17, 18, 26
Level 3: (Lower middle)	4, 6, 7, 8, 13, 14, 15, 21, 27
Level 4 (Poorest):	5, 16, 20, 22, 23, 24, 25

COMMENTS

Well-being Level 1

Some people in this group own big houses where as others own shops which help them earn extra incomes. They also own farms of round 10 hectors and own their own oxen used to plough their land. They have herds of cattle which can amount to 50 each. Some can afford to hire labourers to work in their fields.

Well-being Level 2

People in this group few cattle around 4. Some of their oxen are used for farming but they do not own farming implements. They borrow or hire farming implements from people in the first level of well-being. Their land is quiet big and cultivate bigger portion of land because they can afford to hire implements from people that own farming implements. They too own goats, pigs and a lot of chickens. A few of the people in this group have roofed their houses with iron sheets.

Well-being Level 3

The majority of the people in this group own small pieces of land of around 1 hector which they cultivate using borrowed farming implements. Some of the women in the group are small time traders. They also own a few goats, pigs and chickens and no cattle. A few of them own small radios but none own television sets.

Well-being Level 4

The majority of people in this group depend on relations to assist them have food while others depend on community handouts. They do not own any cattle, pigs or goats. However, they own few chickens.

INFORMANT 2	
Informant:	MARTIN MBANGWETA
Sex:	MALE
Age:	40
Neighbourhood:	KACHABULA
Assistant:	MASIYE NSONGA
Date:	27/05/2015

Level 1 (Richest):	13, 26, 28
Level 2 (Upper middle):	1, 2, 5, 9, 16
Level 3 (Lower middle)	4, 6, 11, 12, 14, 18, 19, 22, 24, 25
Level 4 (Lowest):	3, 7, 8, 10, 15, 17, 20, 21, 23, 27
COMMENTS	
<p>Well-being Level 1 People in this level own more than 50 cattle. They are also farmers owning farm lands of around 6 hectares. They also own a lot of pigs and goats as well as chickens. Their houses are big and roofed with iron sheets. The majority own bicycles, television sets and radio sets. They can afford to have all three meals in a day.</p> <p>Well-being Level 2 People in this group own land of around 4 hectares and own cattle amounting to around 4 – 5. Their houses are medium sized and have iron sheets. They also own a lot of chickens and a few pigs and goats. People in this group can also have meals three times in a day.</p> <p>Well-being Level 3 People in this group live in thatched houses. Their houses are much smaller than those owned by people in level one and two. Their farm lands are around 1 to 2 hectares. They do not own farming implements such as ploughs and their farming is done using hand hoes. They own few goats, pigs and chickens.</p> <p>Well-being Level 4 The majority of people in this group are elderly people that live alone and have no sources of income. The younger members of this group survive on working in other people's fields for little wages. Some of the people in this group burn and sell charcoal. They also farm small pieces of land of around ½ hectares. They do not own any cattle, pigs or goats. However, they own few chickens.</p>	

INFORMANT 3	
Informant:	INONGE SIYANGA
Sex:	FEMALE

Age:	30
Neighbourhood:	KACHABULA
Assistant:	MASIYE NSONGA
Date:	27/05/2015
Level 1 (Richest):	2, 9
Level 2 (Upper middle):	1, 3, 7, 10, 11, 13, 18, 19, 26, 28
Level 3 (Lower middle)	4, 6, 8, 12, 14, 15, 17, 21, 22, 24
Level 4 (Lowest):	5, 16, 20, 23, 25, 27
COMMENTS	
<p>Well-being Level 1 Some people in this group own shops and cattle of over 50. They also own and farm their land of around 10 hectares. They also own farming implements such as ploughs. They farm their land using their own oxen. Their houses are big and roofed with iron sheets. They also own a lot of goats, pigs and chickens.</p> <p>Well-being Level 2 People in this group farm land of around 6 to 8 hectares. They own 3 to 4 herds of cattle. Those that do not own any oxen use hired oxen to plough their fields from people that own oxen. They can also afford to hire labourers to work in their fields. Some live in small houses roofed with iron sheets while others live in thatched houses.</p> <p>Well-being Level 3 People in this level own farm lands of around 1 to 2 hectares. They do not own any cattle. They also live in thatched houses. Very few people in the group own goats and chickens. None of the group members own pigs.</p> <p>Well-being Level 4 Some people in this group are elderly people who can hardly manage to do any work. They entirely depend on hand outs. Some households in this group are child headed households where as other homes are headed by widows. The child headed households depend on hand outs and day labour to survive. They labour in other people's fields for meals and small wages.</p>	

**6.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN
KACHABULA COMMUNITY**

HH No.	Household Name	Well-being level assigned according to informant						
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	AVERAGE SCORE
1	Martin Mbangweta	2	50	2	50	2	50	50
2	Mbanga Ishuwa	1	25	2	50	1	25	33
3	Shadrek Silowa	2	50	4	100	2	50	67
4	Mwaanga Harris	3	75	3	75	3	75	75
5	Audrey Chiboola	4	100	2	50	4	100	83
6	Akabondo Siboleka	3	75	3	75	3	75	75
7	Maketo Mate	3	75	4	100	2	50	75
8	Mwane Silango	3	75	4	100	3	75	83
9	Nalishebo Mondoka	1	25	2	50	1	25	33
10	Kondowe Peter	2	50	4	100	2	50	67
11	Haabwata Moonga	2	50	3	75	2	50	58
12	Freddy Matomola	2	50	3	75	3	75	67
13	Felistas Samuzila	3	75	1	25	2	50	50
14	Mwanga Sikute	3	75	3	75	3	75	75
15	Nambwenga Alex	3	75	4	100	3	75	83
16	Nalishebo Musikili	4	100	2	50	4	100	83
17	Mwaka Kachabuka	2	50	4	100	3	75	75
18	Frank Muhanga	2	50	3	75	2	50	58
19	Philip Makayi	1	25	3	75	2	50	50
20	Chris Mondoka	4	100	4	100	4	100	100
21	Jacob Pelekelo	3	75	4	100	3	75	83
22	Inonge Siyanga	4	100	3	75	3	75	83
23	Benson Chingunya	4	100	4	75	4	100	92
24	Mwiba Namata	4	100	3	75	3	75	83
25	Kelvin Sifaya	4	100	3	75	4	100	92
26	Donald Mbwezwe	2	50	1	25	2	50	42
27	Sanyambe Sitela	3	75	4	100	4	100	92
28	Modester Kachabula	1	25	1	25	2	50	33

6.3 RANK ORDER OF THE HOUSEHOLD IN KACHABULA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	2
2	33	9
3	33	28
4	42	26
5	50	1
6	50	13
7	50	19
8	58	11
9	58	18
10	67	3
11	67	10
12	67	12
13	75	4
14	75	6
15	75	7
16	75	14
17	75	17
18	83	5
19	83	8
20	83	15
21	83	16
22	83	21
23	83	22
24	83	24
25	92	23
26	92	25
27	92	27
28	100	20

7. WEALTH RANKING IN MAKANGA COMMUNITY

7.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MAKANGA COMMUNITY

INFORMANT 1	
Informant:	JOSEPHINE LISELI
Sex:	FEMALE
Age:	35
Neighbourhood:	MAKANGA
Assistant:	MUNALULA LIBUWE
Date:	16/04/2014
Level 1 (Richest) :	38, 39, 40, 41, 45, 46, 48, 50
Level 2 (Upper middle):	12, 20, 24, 25, 49, 55, 56, 60
Level 3 (Lower middle)	2, 11, 21, 26, 27, 28, 32, 33, 34, 35, 36, 42, 43, 44, 51, 53, 54, 58, 59
Level 4 (Poorest):	1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 29, 30, 31, 37, 47, 52, 57
COMMENTS	
<p>Well-being Level 1 People in this group own cattle of over 50. Others run businesses such as grocery shops, buying and selling of fuel and buying and selling maize. They also own farms of over 6 hectors and use their oxen to plough their farms. They own more than one plough each and some of these farming implements are hired out to those that do not have any. They also hire labourers to work in their fields. They also have a lot of goats and chickens. Their houses are big and roofed with iron sheets. They also own television sets and radios. Some own grinding mills.</p>	
<p>Well-being Level 2</p>	

People in this level own cattle of around 15 to 20. They also run small businesses of selling milk and sour milk to local people. Some are fish traders. Some own 2 to 3 goats and few chickens. Their houses are not as big as those owned by people in wellbeing level one, though they too have iron sheet roofing. Their farm lands are around 2 to 3 hectares and they use their oxen to plough their fields. They also own single ploughs each. They also own television sets and radios. In addition, they also own bicycles.

Well-being Level 3

People in this group own 1 to 2 cattle each. Their farm lands are 1 hectare or less. They do not own any farming implements, so they have to hire from those that have. Some of the people in this level are fishermen where as others sell milk and sour milk to local people. Some are fish traders. They do not own any shops. They live in thatched houses. A few own small television sets and radios. Some have goats provided to them by Land O' Lakes under the livestock restocking programme. They do not own any pigs, but they have 1 to 2 chickens each.

Well-being Level 4

These are the poorest of the community. They work in other people's fields to be allowed to use oxen and implements to farm their own small pieces of land. Some do not cultivate their own fields during the farming season but work in other people's fields for small wages and food. They also catch fish as day labour to be given few fish for meals, small wages or to be allowed to use other people's fishing nets to catch fish in return. Some of the people in the group are aged people with no means of survival other than waiting on well-wishers to assist them. Some are child headed households.

INFORMANT 2	
Informant:	FELIX MULIKITI
Sex:	MALE
Age:	39
Neighbourhood:	MAKANGA
Assistant:	MUNALULA LIBUWE
Date:	16/04/2014
Level 1 (Richest):	38, 39, 40, 41
Level 2 (Upper middle):	12, 20, 24, 25, 56, 60

Level 4 (Lower middle)	1, 2, 11, 21, 26, 27, 34, 45, 46, 47, 48, 49, 50, 51, 54, 55, 58
Level 3 (Lowest):	3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 28, 29, 30, 31, 32, 33, 35, 36, 37, 42, 43, 44, 52, 53, 57, 59
COMMENTS	
<p>Well-being Level 1 People in this group own cattle of more than 300 herds. They have enough oxen to plough their fields and have enough farming implements. They also own big farm lands of around 6 to 10 hectares. Some own grinding mills. They also have big houses roofed with iron sheets. They also own shops. Some are engaged in the buying and selling of cattle. Some own more than 100 goats. Some own pigs of around 5 to 10. They also own a lot of chickens.</p> <p>Well-being Level 2 People in this group own cattle of around 50 to 100 herds. They plough land of 4 to 5 hectares. They have their own oxen to use to plough land. Some have houses with iron sheets where as others live in thatched houses. They own goats of around 10 and below. They also own pigs ranging from 1 to 5. Their chickens are around 10 to 16. They do small businesses of buying and selling fish as well as buying and selling sour milk. Still, some of them are smalltime fishermen.</p> <p>Well-being Level 3 Some people in this group are involved in the buying and selling of fish. They also buy and sell sour milk. Some brew and sale local beer. Their farm lands are around 1 to 2 hectares. A few own 1 or 2 cattle whereas the majorities do not have any cattle. They also own goats and pigs of between 5 and 10 and live in thatched houses.</p> <p>We-being level 4 People in this group survive on day labour – working in other people’s fields. They do not farm their own land but go to farm in other people’s fields to be given small wages and food. They also work as fishermen, catching fish for people with nets so that they can be assisted with fish or paid wages. Some of the people in this group are elderly with no strength to work where as others are child headed households. People in this group live in thatched houses.</p>	

INFORMANT 3	
Informant:	SILIO MWEEMBA
Sex:	MALE

Age:	29
Neighbourhood:	MAKANGA
Assistant:	MUNALULA LIBUWE
Date:	16/04/2014
Level 1 (Richest):	24, 25, 38, 39, 40, 41, 46, 56, 60
Level 2 (Medium):	1, 2, 11, 12, 20, 22, 26, 27, 29, 32, 34, 35, 45, 47, 48, 49, 50, 55
Level 3 (Lowest):	3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 21, 23, 28, 30, 31, 33, 36, 37, 42, 43, 44, 51, 52, 53, 54, 57, 58, 59
COMMENTS	
<p>Well-being Level 1 People in this group own cattle of more than 50 to 100. They also have oxen and farming implements such as ploughs and harrows. Some also own shops, grinding mills and vehicles for their transport businesses. They also own big houses roofed with iron sheets. Their farm lands are around 10 hectors. They also own around 30 to 60 pigs and chickens of over 20.</p> <p>Well-being Level 2 Their cattle are around 15 to 20. Their farm lands are around 5 hectors. They use their own oxen and farming implements to farm their land. They also own goats of around 10 to 15 each. They do not own any pigs. However, they have chickens of around 4 to 6. While some of them live in thatched houses, others live in houses roofed with iron sheets. They sale milk and sour milk to earn extra incomes and they catch fish for sale. Some of the people within the group that cannot catch fish buy it for resale.</p> <p>Well-being Level 3 People in this group survive on labouring in other people's fields. They also do day labour catching fish for people with fishing nets. They own small farm lands of around ½ hectors. They also own 2 to 3 goats, no pigs and 1 to 3 chickens. They do not own any cattle and they live in thatched houses.</p>	

7.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN MAKANGA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	AVERAGE SCORE
1	Eunice Mwitumwa	4	100	3	75	2	67	81
2	Muhau Mwitumwa	3	75	3	75	2	67	72
3	Likeleli Mwitumwa	4	100	4	100	3	100	100
4	Josephine Liseli	4	100	4	100	3	100	100
5	Sililo Mweemba	4	100	4	100	3	100	100
6	Rosina Kawana	4	100	4	100	3	100	100
7	Memory Mulikiti	4	100	4	100	3	100	100
8	Muyumbana Mweemba	4	100	4	100	3	100	100
9	Joyce Mulikiti	4	100	4	100	3	100	100
10	Jane Sililo	4	100	4	100	3	100	100
11	Kamwi Mubita	3	75	3	75	2	67	72
12	Mubita Mbangweta	2	50	2	50	2	67	57
13	Namasiku Nkani	4	100	4	100	3	100	100
14	Betty Siyanga	4	100	4	100	3	100	100
15	Felix Mulikiti	4	100	4	100	3	100	100
16	Laurence Siyanga	4	100	4	100	3	100	100
17	Iness Kandela	4	100	4	100	3	100	100
18	Mangolwa Siyauya	4	100	4	100	3	100	100
19	Inambao Mushekwa	4	100	4	100	3	100	100
20	Charles Mayungo	2	50	2	50	2	67	56
21	Namakau Mayungo	3	75	3	75	3	100	83
22	Masibi Nyambe	4	100	4	100	2	67	89
23	Muyatwa Nyambe	4	100	4	100	3	100	100
24	Kenny Siboleka	2	50	2	50	1	33	44
25	Pelekelo Siboleka	2	50	2	50	1	33	44
26	Malambo Siboleka	3	75	3	75	2	67	72
27	Mampi Siboleka	3	75	3	75	2	67	72
28	Lute Siboleka	3	75	4	100	3	100	92
29	Ntelamo Siboleka	4	100	4	100	2	67	89
30	Mwangala Siboleka	4	100	4	100	3	100	100
31	Samuel Siboleka	4	100	4	100	3	100	100
32	Boma Zebia Lunake	3	75	4	100	2	67	81

33	Manga Lunake	3	75	4	100	3	100	92
34	Nambile Lunake	3	75	3	75	2	67	72
35	Nambile Lunake	3	75	4	100	2	67	81
36	Luka Lunake	3	75	4	100	3	100	92
37	Timmy Sitali	4	100	4	100	3	100	100
38	Sezuzi Mahaha	1	25	1	25	1	33	44
39	Kapelwa Sezuni	1	25	1	25	1	33	44
40	Siponi Sezuni	1	25	1	25	1	33	44
41	Mutafela Sezuni	1	25	1	25	1	33	44
42	Chunga Pendu	3	75	4	100	3	100	92
43	Hanjika Pendu	3	75	4	100	3	100	92
44	Mabombo Saabeenzu	3	75	4	100	3	100	92
45	Mate Sezuni	1	25	3	75	2	67	56
46	Muyunda Sezuni	1	25	3	75	1	33	44
47	Buumba Sezuni	4	100	3	75	2	67	81
48	Kakulubelwa Sezuni	1	25	3	75	2	67	56
49	Masauso Ben	2	50	3	75	2	67	64
50	Boma Nankole	1	25	3	75	2	67	56
51	Ceasa-Bondate Mbwainga	3	75	3	75	3	100	83
52	Namatama Masuaso	4	100	4	100	3	100	100
53	Boma Brona	3	75	4	100	3	100	92
54	Boma Mukela	3	75	3	75	3	100	83
55	Soonga Mushukwa	2	50	3	75	2	67	64
56	Mushaukwa Mushaukwa	2	50	2	50	1	33	44
57	Kwenani Kamuti	4	100	4	100	3	100	100
58	Nalufu Nalufu	3	75	3	75	3	100	83
59	Namukolo Chika	3	75	4	100	3	100	92
60	Sianga Mowa	2	50	2	50	1	33	44

7.3 RANK ORDER OF THE HOUSEHOLD IN MAKANGA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	44	24
2	44	25

3	44	38
4	44	39
5	44	40
6	44	41
7	44	46
8	44	56
9	44	60
10	56	20
11	56	45
12	56	48
13	56	50
14	57	12
15	64	44
16	64	55
17	72	2
18	72	11
19	72	26
20	72	27
21	72	34
22	81	1
23	81	32
24	81	35
25	81	47
26	83	21
27	83	51
28	83	54
29	83	58
30	89	22
31	89	29
32	92	28
33	92	33
34	92	36
35	92	42
36	92	43
37	92	44
38	92	53

39	92	59
40	100	3
41	100	4
42	100	5
43	100	6
44	100	7
45	100	8
46	100	9
47	100	10
48	100	13
49	100	14
50	100	15
51	100	16
52	100	17
53	100	18
54	100	19
55	100	23
56	100	30
57	100	31
58	100	37
59	100	52
60	100	57

8. WEALTH RANKING IN KAWANA COMMUNITY

8.1 RECORDING RESPONSES OF WEALTH RANKINGS IN KAWANA COMMUNITY

INFORMANT 1	
Informant:	MUNGOLE KAWANA
Sex:	MALE

Age:	51
Neighbourhood:	KAWANA
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest) :	1, 2, 3, 5, 7, 10, 12, 19
Level 2 (Upper middle):	4, 8, 14, 15, 17
Level 3 (Lower middle)	6, 16
Level 4 (Poorest):	9, 11, 13, 18
COMMENTS	
<p>Well-being Level 1 People in this group own farm sizes of around 6 hectors. They also own chickens of around 10 and goats of around 15. They also own cattle of around 1 to 2. Some have farming implements such as ploughs to cultivate their fields and can also afford to hire a few labourers to work in their fields.</p> <p>Well-being Level 2 They own land of around 4 hectors. They also own around 10 chickens. They do not own any goats neither do they own cattle. They do not own any farming implements. Using money earned from their small businesses they run, they sometimes have money to hire people with oxen to plough their fields.</p> <p>Well-being Level 3 They own land of around 2 to 3 hectors. People in this group own 4 to 5 chickens. They do not own any goats neither do they own cattle. These people cannot afford to pay people with oxen to work in their fields neither can they afford labourers. They plough their fields using hand hoes.</p> <p>Well-being Level 4 People in this group do not own any cattle or goats. The few that own goats only have 1 to 2. They survive through buying and selling fish locally and making baked foods for sale. They do not own their own fishing nets to catch fish but do day labour from those that own nets so that they can be allowed to use their nets. They also survive through working in other people's fields leaving their fields unattended.</p>	

INFORMANT 2	
Informant:	KEKELWA KAWANA
Sex:	MALE
Age:	40
Neighbourhood:	KAWANA
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 2, 15, 19
Level 2 (Upper Middle):	8, 13
Level 3 (Lower Middle)	4, 5, 6, 7, 9, 10, 11, 12, 16, 18
Level 4 (Lowest):	3, 14, 17
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own big pieces of land of around 6 to 8 hectares. They cultivate their land using oxen and also own farming implements. Some of the people in this group are in a business of mining and selling of river sand. Some are retired government workers who still have money to effectively run their farms. They can also afford to buy seeds for planting. They own a few cattle and goats and a lot of chickens. They can also afford to hire labourers to work in their fields.</p> <p>Well-being Level 2 The majorities of people in this group are full time fishermen/women and earn a living from catching and selling fish. They also own farms of around 4 hectares. They can afford to buy seeds for planting from the money raised out of the fish sales. They do not own any farming implements; neither do they own cattle nor goats. They own a few chickens.</p> <p>Well-being Level 3</p>	

The majority of people in this group are charcoal burners. They do a bit of farming, cultivating land of around 2 hectares. They do not own any farming implements hence they cultivate their land using hand hoes. They cannot afford to hire labourers. Some of the people in this group work in other people's fields to earn income while others catch fish for people with nets as day labour.

Well-being Level 4
 This group has a lot of elderly people with little strength to work. Some of the people in this group are widowed women and some are of ill health. They depend on hand outs for food from community members.

INFORMANT 3	
Informant:	CHARITY KAWANA
Sex:	FEMALE
Age:	37
Neighbourhood:	KAWANA
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 2, 12, 14, 15, 18, 19
Level 2 (Medium):	3, 8, 9, 10, 16
Level 3 (Lowest):	4, 5, 6, 7, 11, 13, 17
COMMENTS	
<p>Well-being Level 1 The majority of people in this well-being level earn money from sand mining activities. Some are retired government workers who still have money that they use to run their businesses of sand mining. Some own farming implements and cattle that they hire out to people that do not own farming implements. They can also afford to hire labourers to work in their fields.</p> <p>Well-being Level 2</p>	

People in this group are engaged in fishing activities for sale. Some also cook and sale food such as buns, scorns and fritters. Others do day labour in other people's fields to earn an income. Some are engaged in charcoal burning and selling to earn an income.

Well-being Level 3

People in this group are normally helped by fellow community members. They can hardly afford to buy their own food to eat. They raise a bit of money for food through working in other people's fields. They do not own any fishing nets but sometimes do day labour in other people's fields to be allowed to use nets for fishing.

INFORMANT 4	
Informant:	FAUSTINA MUNKONGOLE
Sex:	FEMALE
Age:	62
Neighbourhood:	KAWANA
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 2, 12, 14, 15, 19
Level 2 (Upper Middle):	3, 8
Level 3 (Lower Middle)	4, 5, 6, 7, 9, 10, 11, 13, 16, 17
Level 4 (Lowest):	18
COMMENTS	
<p>Well-being Level 1 People in this well-being level own farm lands sized around 6 hectors. They also own chickens of around 10 and goats of around 15. They also own around 1 to 2 cattle. Some have farming implements such as ploughs to cultivate their fields and can also afford to hire a few labourers to work in their fields.</p>	

Well-being Level 2

People in this level of well-being own land of around 4 hectares. They also own around 10 chickens. They do not own any goats neither do they own cattle. They do not own any farming implements. Through small businesses they run, they sometimes have money to pay people with oxen to plough their fields.

Well-being Level 3

They own land of around 2 to 3 hectares. People in this group own 4 to 5 chickens. They do not own any goats neither do they own cattle. These people cannot afford to pay people with oxen to plough their fields neither can they afford to hire labourers. They plough their fields using hand hoes.

8.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN KAWANA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant								AVERAGE SCORE
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	INF 4 (3)	INF 4 SCORE	
1	Mungole Kawana	1	25	1	25	1	33	1	25	27
2	Kekelwa Kawana	1	25	1	25	1	33	1	25	27
3	Christina Kekelwa	1	25	4	100	2	67	2	50	61
4	Daisy Kawana	2	50	3	75	3	100	3	75	75
5	Mwanangombe Mungole	1	25	3	75	3	100	3	75	69
6	Charity Mungole	3	75	3	75	3	100	3	75	81
7	Progress Munguni	1	25	3	75	3	100	3	75	69
8	Nawa Mushitu	2	50	2	50	2	67	2	50	54
9	Nankole Mungole	4	100	3	75	2	67	3	75	79
10	Christine Simasiku	1	25	3	75	2	67	3	75	61
11	Makandauko Muluti	4	100	3	75	3	100	3	75	86
12	Mubita Simasiku	1	25	3	75	1	33	1	25	40
13	Kakwenya Namwi	4	100	2	50	3	100	3	75	81
14	Cecilia Kekelwa	2	50	4	100	1	33	1	25	52
15	Eunice Chibangu	2	50	1	25	1	33	1	25	33
16	Malita Sitwala	3	75	3	75	2	67	3	75	73
17	Esther Nawa	2	50	4	100	3	100	3	75	81

18	Shailoki Mubita	4	100	3	75	1	33	4	100	77
19	Maata Maata	1	25	1	25	1	33	1	25	27

8.3 RANK ORDER OF THE HOUSEHOLD IN KAWANA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	27	1
2	27	2
3	27	19
4	33	15
5	40	12
6	52	14
7	54	8
8	61	3
9	61	10
10	69	5
11	69	7
12	73	16
13	75	4
14	77	18
15	79	9
16	81	6
17	81	13
18	81	17
19	86	11

9. WEALTH RANKING IN MUNAMBWE COMMUNITY

9.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MUNAMBWE COMMUNITY

INFORMANT 1	
Informant:	MAUREEN KASAPULA
Sex:	FEMALE
Age:	29
Neighbourhood:	MUNAMBWE
Assistant:	MASIYE NSONGA
Date:	27/05/2015
Level 1 (Richest) :	1, 3, 7, 8
Level 2 (Medium):	2, 5, 9, 10, 12
Level 3 (Poorest):	4, 6, 11, 13

COMMENTS

Well-being Level 1

Some people in this group own shops and cattle of over 50. They also own and farm their land of around 10 hectares. They also own farming implements such as ploughs. They farm their land using their own oxen. Their houses are big and roofed with iron sheets. They also own a lot of goats, pigs and chickens.

Well-being Level 2

People in this group farm land of around 6 to 8 hectares. They own 3 to 4 herds of cattle. Those that do not own any oxen use hired oxen to plough their fields from people that own oxen. They can also afford to hire labourers to work in their fields. Some live in small houses roofed with iron sheets while others live in thatched houses.

Well-being Level 3

Some people in this group are elderly people who can hardly manage to do any work. They entirely depend on hand outs. Some households in this group are child headed households where as other homes are headed by widows. The child headed households depend on hand outs and day labour to survive. They labour in other people's fields for meals and small wages.

INFORMANT 2	
Informant:	LUBONA MASIYE
Sex:	MALE
Age:	40
Neighbourhood:	MUNAMBWE
Assistant:	MASIYE NSONGA
Date:	27/05/2015
Level 1 (Richest):	1, 6, 7, 10
Level 2 (Medium):	4, 5, 8, 12

Level 3 (Lowest):	2, 3, 9, 11, 13
COMMENTS	
<p>Well-being Level 1 Some people in this group own big houses where as others own shops which help them earn extra incomes. They also own farms of round 10 hectors and own their own oxen used to plough their land. They have herds of cattle which can amount to 50 each. Some can afford to hire labourers to work in their fields.</p>	
<p>Well-being Level 2 People in this group few cattle around 4. Some of their oxen are used for farming but they do not own farming implements. They borrow or hire farming implements from people in the first level of well-being. Their land is quiet big and cultivate bigger portion of land because they can afford to hire implements from people that own farming implements. They too own goats, pigs and a lot of chickens. A few of the people in this group have roofed their houses with iron sheets.</p>	
<p>Well-being Level 3 The majority of people in this group depend on relations to assist them have food while others depend on community handouts. They do not own any cattle, pigs or goats. However, they own few chickens.</p>	

INFORMANT 3	
Informant:	MELVIN SILUNDE
Sex:	MALE
Age:	38
Neighbourhood:	MUNAMBWE
Assistant:	MASIYE NSONGA
Date:	27/05/2015
Level 1 (Richest):	1, 7, 9, 10

Level 2 (Medium):	5, 6, 11
Level 3 (Lowest):	2, 3, 4, 8, 12, 13
COMMENTS	
<p>Well-being Level 1 People in this level own more than 50 cattle. They are also farmers owning farm lands of around 6 hectors. They also own a lot of pigs and goats as well as chickens. Their houses are big and roofed with iron sheets. The majority own bicycles, television sets and radio sets. They can afford to have all three meals in a day.</p> <p>Well-being Level 2 People in this group own land of around 4 hectors and own cattle amounting to around 4 – 5. Their houses are medium sized and have iron sheets. They also own a lot of chickens and a few pigs and goats. People in this group can also have meals three times in a day.</p> <p>Well-being Level 3 The majority of people in this group are elderly people that live alone and have no sources of income. The younger members of this group survive on working in other people’s fields for little wages. Some of the people in this group burn and sell charcoal. They also farm small pieces of land of around ½ hectors. They do not own any cattle, pigs or goats. However, they own few chickens.</p>	

9.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN KAWANA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Lubona Masiye	1	33	1	33	1	33	33
2	Margarate Sampaya	2	67	3	100	3	67	78
3	Kambona Lubi	1	33	3	100	3	67	67
4	Maureen Kasapula	3	100	2	67	3	33	67
5	Kasontobwa Mwimba	2	67	2	67	2	67	67
6	Melvin Silunde	3	100	1	33	2	67	67
7	Kelvin Manda	1	33	1	33	1	33	33
8	Simangolwa Mate	1	33	2	67	3	100	67

9	Kabala Tokoya	2	67	3	100	1	33	67
10	Sofia Sampaya	2	67	1	33	1	33	44
11	Modester Kashanga	3	100	3	100	2	67	89
12	Mandrine Chingobela	2	67	2	67	3	100	89
13	Namushi Taulo	3	100	3	100	3	100	100

9.3 RANK ORDER OF THE HOUSEHOLD IN MUNAMBWE COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	1
2	33	7
3	44	10
4	67	3
5	67	4
6	67	5
7	67	6
8	67	8
9	67	9
10	78	2
11	89	11
12	89	12
13	100	13

10. WEALTH RANKING IN SILILO COMMUNITY

10.1 RECORDING RESPONSES OF WEALTH RANKINGS IN SILILO COMMUNITY

INFORMANT 1

Informant:	MULEYA SIANANGA
Sex:	MALE
Age:	38
Neighbourhood:	SILILO
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest) :	1, 2, 4, 10
Level 2 (Upper middle):	3, 9
Level 3 (Lower middle)	6, 7
Level 4 (Poorest):	5, 8
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p> <p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 to 3. They also own ploughs used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p> <p>Well-being Level 3 People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs to cultivate their fields. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.</p> <p>Well-being Level 4</p>	

This group comprise of child headed households (orphaned headed) and elderly people that have means of raising money except depending on handouts for survival.

INFORMANT 2	
Informant:	JOSIAS SILILO
Sex:	MALE
Age:	40
Neighbourhood:	SILILO
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 2, 4, 7, 9, 10
Level 2 (Medium):	5, 6
Level 3 (Lowest):	3, 8
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p> <p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 or 3. They also own plough used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p> <p>Well-being Level 3</p>	

People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.

INFORMANT 3	
Informant:	MAURICE KEKELWA
Sex:	MALE
Age:	45
Neighbourhood:	SILILO
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 2, 4
Level 2 (Medium):	7, 9, 10
Level 3 (Lowest):	3, 5, 6, 8
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p>	
<p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 to 3. They also own ploughs used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p>	
<p>Well-being Level 3</p>	

People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs to cultivate their fields. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.

10.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN SILILO COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (4)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Noria Siyumbwa	1	25	1	33	1	33	30
2	Josias Sililo	1	25	1	33	1	33	30
3	Victor Mwange	2	50	3	100	3	100	83
4	Gloria Mukamambo	1	25	1	33	1	33	30
5	Maurice Kekelwa	4	100	2	67	3	100	89
6	Kabisa Mununka	3	75	2	67	3	100	81
7	Mwangala Konayuma	3	75	1	33	2	67	58
8	Bornface Munalula	4	100	3	100	3	100	100
9	Akabondo Kekelwa	2	50	1	33	2	67	50
10	Muleya Siananga	1	25	1	33	2	67	42

10.3 RANK ORDER OF THE HOUSEHOLD IN SILILO COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	30	1
2	30	2
3	30	4
4	42	10
5	50	9
6	58	7
7	81	6
8	83	3

9	89	5
10	100	8

11. WEALTH RANKING IN BBILIBISI COMMUNITY

11.1 RECORDING RESPONSES OF WEALTH RANKINGS IN BBILIBISI COMMUNITY

INFORMANT 1	
Informant:	MEMORY MUTUKWA
Sex:	FEMALE
Age:	28
Neighbourhood:	BBILIBISI
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest) :	8, 9, 10, 11, 13, 15, 16, 17, 18, 22, 23, 24, 25, 26, 32, 33, 34
Level 2 (Medium):	5, 12, 19, 20, 21, 28, 29, 31, 35, 36
Level 3 (Poorest):	1, 2, 3, 4, 6, 7, 14, 27, 30
COMMENTS	
<p>Well-being Level 1 People in this group are cattle owners amounting to around 10 to 15 cattle each. They also own oxen to cultivate their fields hence they cultivate big fields of around 4 to 5 hectars. They also own farming implements. They own a good number of goats, pigs and chickens. Some take goats and other small livestock to Kazungula Boarder and across the border for sale.</p>	

Well-being Level 2
 People in this group do not own any cattle; neither do they own pigs or goats. They are small business persons. They trade in small kitchen utensils and other household utensils in exchange for maize or other food crop. Some of the small business persons in this group just require having their fields ploughed by those who own oxen; hence they ask cattle owners to plough their fields in exchange for kitchen utensils. They however own a few chickens. They can sometimes afford to pay people to work in their fields from the money they make from trading in household utensils

Well-being Level 3
 People in this group are labourers working in other people's fields in exchange for money or food. Sometimes, they work fields belonging to people with oxen in exchange to have their own fields ploughed by the cattle owners. They cultivate small pieces of land of around ½ to 1 hectares. They do not own any cattle, pigs or goats. Some own very few chickens of around 1 to 4. They however do small businesses of burning and selling charcoal.

INFORMANT 2	
Informant:	BOSSWELL SIMASIKU
Sex:	MALE
Age:	45
Neighbourhood:	BBILIBISI
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	8, 9, 11, 13, 15, 16, 17, 22, 23, 26, 32, 33, 34
Level 2 (Medium):	1, 2, 5, 10, 12, 18, 19, 20, 21, 24, 28, 29, 31, 35, 36
Level 3 (Lowest):	3, 4, 6, 7, 14, 25, 27, 30
COMMENTS	
Well-being Level 1	

People in this group are cattle owners of around 10 to 15 cattle. They also own oxen to cultivate their fields hence they cultivate big fields of around 4 to 5 hectares. They also own farming implements. They own a good number of goats, pigs and chickens. Some take goats and other small livestock to Kazungula Border and across the border for sale.

Well-being Level 2

People in this group do not own any cattle; neither do they own pigs or goats. They are small business persons. They trade in small kitchen utensils and other household utensils in exchange for maize or other food crop. Some of the small business persons in this group just require having their fields ploughed by those who own oxen; hence they ask cattle owners to plough their fields in exchange for small utensils. They however own a few chickens.

Well-being Level 3

People in this group are labourers cultivating in other people's fields in exchange for money or food. Sometimes, they work in fields belonging to people with oxen in exchange to have their own fields ploughed by the cattle owners. They cultivate small pieces of land of around ½ to 1 hectares. They do not own any cattle, pigs or goats. Some own very few chickens of around 1 to 4. They however do small businesses of burning and selling charcoal.

INFORMANT 3	
Informant:	BEAUTY MUTUKWA
Sex:	FEMALE
Age:	22
Neighbourhood:	BBILIBISI
Assistant:	MASIYE NSONGA
Date:	17/04/2014
Level 1 (Richest):	1, 5, 9, 10, 13, 15, 16, 17, 18, 20, 22, 23, 24, 26, 32, 33, 34, 35, 36
Level 2 (Medium):	2, 8, 11, 12, 19, 21, 25, 27, 28, 30, 31
Level 3 (Lowest):	3, 4, 6, 7, 14, 29

COMMENTS

Well-being Level 1

People in this group are cattle owners of around 10 to 15 cattle. They also own oxen to cultivate their fields hence they cultivate big fields of around 4 to 5 hectares. They also own farming implements. They own a good number of goats, pigs and chickens. Some take goats and other small livestock to Kazungula Border and across the border for sale.

Well-being Level 2

People in this group do not own any cattle; neither do they own pigs or goats. They are small business persons. They trade in small kitchen utensils and other household utensils in exchange for maize or other food crop. Some of the small business persons in this group just require having their fields ploughed by those who own oxen; hence they ask cattle owners to plough their fields in exchange for small utensils. They however own a few chickens. Some of the people in this group own around 1 to 2 fishing nets.

Well-being Level 3

People in this group are labourers mainly working in other people's fields in exchange for wages. Sometimes, they work fields belonging to people with oxen in exchange to have their own fields ploughed by the cattle owners. They cultivate small pieces of land of around ½ to 1 hectares. They do not own any cattle, pigs or goats. Some own very few chickens of around 1 to 4. They however do small businesses of burning and selling charcoal. They also do work piece as fishermen for people who own nets to be given fish or money in return.

11.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN BBILIBISI COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Maggie Phiri	3	100	2	67	1	33	67
2	Patricia Kamwanga	3	100	2	67	2	67	78
3	Harriet Kamwanga	3	100	3	100	3	100	100
4	Makwanza Nalisa	3	100	3	100	3	100	100
5	Kabuku Nyambe	2	67	2	67	1	33	57
6	Sharon Mufaya	3	100	3	100	3	100	100
7	Josephine Namakau	3	100	3	100	3	100	100
8	Elizabeth Mwila	1	33	1	33	2	67	44
9	Samson Baushi Muyano	1	33	1	33	1	33	33

10	Mildred Bina Beene	1	33	2	67	1	33	44
11	Wanki Lubinda	1	33	1	33	2	67	44
12	Kachana Mutema	2	67	2	67	2	67	67
13	Mwiya Nawa	1	33	1	33	1	33	33
14	Joyce Mutema	3	100	3	100	3	100	100
15	Inambao Mubita	1	33	1	33	1	33	33
16	Richard Mutema	1	33	1	33	1	33	33
17	Fenny Mutema	1	33	1	33	1	33	33
18	Bina Dorothy	1	33	2	67	1	33	44
19	Bosswell Simasiku	2	67	2	67	2	67	67
20	Miliko Nsando	2	67	2	67	1	33	57
21	Joe Baushi Simulilo	2	67	2	67	2	67	67
22	Kabika Nsando	1	33	1	33	1	33	33
23	Johnson Siamazoka	1	33	1	33	1	33	33
24	Sanyambe Nsando	1	33	2	67	1	33	44
25	Mavikani Chikwayi	1	33	3	100	2	67	67
26	Anna Chikwai	1	33	1	33	1	33	33
27	Sara Simasiku	3	100	3	100	2	67	89
28	Rabecca Simasiku	2	67	2	67	2	67	67
29	Nasilele Sijo	2	67	2	67	3	100	78
30	Bina Chikuni	3	100	3	100	2	67	89
31	Miriam Simasiku	2	67	2	67	2	67	67
32	Bina Moonga	1	33	1	33	1	33	33
33	Amon Mbunu	1	33	1	33	1	33	33
34	Bo Kabuku	1	33	1	33	1	33	33
35	Bo Sianga	2	67	2	67	1	33	57
36	Shadrek Simasiku	2	67	2	67	1	33	57

11.3 RANK ORDER OF THE HOUSEHOLD IN BBILIBISI COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	9
2	33	13
3	33	15

4	33	16
5	33	17
6	33	22
7	33	23
8	33	26
9	33	32
10	33	33
11	33	34
12	44	8
13	44	10
14	44	11
15	44	18
16	44	24
17	57	5
18	57	20
19	57	35
20	57	36
21	67	1
22	67	12
23	67	18
24	67	21
25	67	25
26	67	28
27	67	31
28	78	2
29	78	29
30	89	27
31	89	30
32	100	3
33	100	4
34	100	6
35	100	7
36	100	14

12. WEALTH RANKING IN NAMAPANDE COMMUNITY

12.1 RECORDING RESPONSES OF WEALTH RANKINGS IN NAMAPANDE COMMUNITY

INFORMANT 1	
Informant:	FLORENCE MUBITA
Sex:	FEMALE
Age:	51
Neighbourhood:	NAMAPANDE
Assistant:	MASIYE NSONGA
Date:	19/04/2014
Level 1 (Richest) :	1, 2, 4, 5, 6, 7, 9, 10, 11, 12, 13, 16, 18, 19, 20, 21, 22, 28, 30, 31, 32, 40, 43
Level 2 (Medium):	3, 8, 15, 17, 23, 25, 27, 34, 38, 39, 41, 44, 49, 51, 52, 53, 55, 56, 57
Level 3 (Poorest):	14, 24, 26, 29, 33, 35, 36, 37, 42, 45, 46, 47, 48, 50, 54, 58, 59, 60
COMMENTS	
<p>Well-being Level 1 People in this group own farming implements and oxen. They also do businesses of selling groceries in their shops. Some have children living outside the community that support them monthly. Others own vehicles used for transport businesses. They own cattle of around 12 and above and goats of around 10 to 50. They own crop fields of around 5 hectares and use their oxen to cultivate their fields. They can also afford to hire labourers to work in their fields.</p> <p>Well-being Level 2 The majority of people in this group do not own farming implements. Only a few have farming implements. They own fields of around 3 to 4 hectares and have 1 or 2 cattle. Some of them do not own any cattle but can afford to hire cattle owners to plough their fields from the money raised from their small businesses. However, they cannot afford to hire labourers to work in their fields because they have limited sources of income. They own goats of around 4 to 5 and a number of chickens. They also do small businesses of selling charcoal.</p>	

Well-being Level 3

People in this group do not own any farming implements. They cultivate very small farm lands because they do not own any oxen neither do they own farming implements. They work in other people's fields for money in exchange for favours such as using farming implements belonging to people in level one. They also do not have any form of businesses. The majority of people in this group are child headed houses and widows.

INFORMANT 2	
Informant:	LUNGOWE LIYALI
Sex:	FEMALE
Age:	52
Neighbourhood:	NAMAPANDE
Assistant:	MASIYE NSONGA
Date:	19/04/2014
Level 1 (Richest):	1, 2, 4, 5, 7, 9, 12, 16, 20, 21, 22, 30, 31, 32, 40, 43
Level 2 (Medium):	3, 6, 8, 10, 11, 13, 39, 55
Level 3 (Lowest):	14, 15, 17, 18, 19, 23, 24, 25, 33, 34, 35, 36, 37, 39, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60
COMMENTS	
<p>Well-being Level 1 People in this group own cattle and farming implements. They also own oxen that they use for farming purposes. They also have children outside the community that help them with household goods and food in times of crop failure. They also own bigger farm lands and sale their food crop. They also own goats that they sell. Some also own vehicles used for transport purposes.</p> <p>Well-being Level 2 They own farm lands and a few cattle. They also have farming implements. They also do some fishing businesses of buying and selling of fish. Some of them own one or so fishing nets used to catch fish for sell.</p>	

Well-being Level 3

People in this group do a lot of day labour to survive. They also burn and sell charcoal for sale. A few of the people in this group do a bit of farming while others wait for handouts. Those that do farming have to work in other people's fields in order to be allowed to use their oxen. Some of the people in this group are elderly people while others are child headed household. People in this group own a few chickens and 3 to 4 goats.

INFORMANT 3	
Informant:	LIKANDO KALIMUKWA
Sex:	MALE
Age:	56
Neighbourhood:	NAMAPANDE
Assistant:	MASIYE NSONGA
Date:	19/04/2014
Level 1 (Richest):	1, 2, 5, 7, 12, 20, 21, 22, 30, 40
Level 2 (Medium):	3, 4, 9, 10, 11, 15, 16, 17, 18, 27, 28, 31, 32, 38, 39, 55
Level 3 (Lowest):	6, 8, 13, 14, 19, 23, 24, 25, 26, 29, 33, 34, 35, 36, 37, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60
COMMENTS	
<p>Well-being Level 1 People in this group own cattle of around 25 to 60 herds. They also own farming implements used to farm their fields. Their fields are around 6 hectors in size. They also use their farming implements to make money by hiring them out to people without farming implements. Some people in this group are also involved in bee keeping activities and earn extra income from selling honey in town. They produce a lot of maize that is sold to Food and Reserve Agency (FRA). They also sale cattle if in dire need of money especially for children's school fees and paying for hospital bills.</p>	
<p>Well-being Level 2</p>	

People in this group own small businesses of buying and selling of household goods. Others are fishermen in the businesses of catching and selling fish. They are also crop growers owning fields of 2 to 3 hectors. People in this group do not have farming implements neither do they own oxen. However, they can afford to hire labourers to work in their fields from the money they make from crop produce. They also keep goats that are sold when they multiply to earn incomes.

Well-being Level 3

The majority of people in this group trade in charcoal. They burn and sale charcoal at very low prices making marginal profits due to limited market opportunities. They also own 2 to 3 goats and no cattle. They own small fields and produce food which is not sufficient to last them the entire year. The shortfall of food is sometimes covered through selling of goats to earn income for buying required food.

12.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN NAMAPANDE COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Likando Kalimukwa	1	33	1	33	1	33	33
2	Billy Mulenga	1	33	1	33	1	33	33
3	Bridget Chala	2	67	2	67	2	67	67
4	Catherine Sinange	1	33	1	33	2	67	44
5	Maureen Mushiba	1	33	1	33	1	33	33
6	Daniel Sampondo	1	33	2	67	3	100	67
7	Felix Mbeha	1	33	1	33	1	33	33
8	Likando Kalaluka	2	67	2	67	3	100	78
9	Harrison Mulemwa	1	33	1	33	2	67	44
10	Nyambe Nyambe	1	33	2	67	2	67	44
11	Mubita Mulalu	1	33	2	67	2	67	44
12	Sinkende Munyaza	1	33	1	33	1	33	33
13	Pezo Zuze	1	33	2	67	3	100	67
14	Rosemary Kabika	3	100	3	100	3	100	100
15	Thomas Muleya	2	67	3	100	2	67	78
16	Mushabati Mubili	1	33	1	33	2	67	44
17	Mungabwa Pekelo	2	67	3	100	2	67	78
18	Fresher Zuze	1	33	3	100	2	67	67

19	Kabika Mbangweta	1	33	3	100	3	100	77
20	Bo Mweemba	1	33	1	33	1	33	33
21	Bob Fazzi	1	33	1	33	1	33	33
22	Clement Sitali	1	33	1	33	1	33	33
23	Maureen Sampondo	2	67	3	100	3	100	89
24	Dumisani Sampondo	3	100	3	100	3	100	100
25	Nalisa Mulonda	2	67	3	100	3	100	89
26	Boma Anita	3	100	3	100	3	100	100
27	Nyamozi Kapala	2	67	3	100	2	67	78
28	Kelvin Kayama	1	33	3	100	2	67	67
29	Situmbeko Muyangwa	3	100	3	100	3	100	100
30	Elizabeth Mukela	1	33	1	33	1	33	33
31	Peter Nyambe	1	33	1	33	2	67	44
32	Ruth Mbangweta	1	33	1	33	2	67	44
33	Martha Simasiku	3	100	3	100	3	100	100
34	Boma Sitali	2	67	3	100	3	100	89
35	Boma Jonah	3	100	3	100	3	100	100
36	Hellen Muhongo	3	100	3	100	3	100	100
37	Bo Sondongo	3	100	3	100	3	100	100
38	Wachama Zuze	2	67	3	100	2	67	78
39	Voster Mushabati	2	67	2	67	2	67	67
40	Phenius Mushabati	1	33	1	33	1	33	33
41	Goliath Koloba	2	67	3	100	3	100	89
42	Songiso Siyauya	3	100	3	100	3	100	100
43	Bomale Sepiso	1	33	1	33	3	100	55
44	Mbaita Silumelume	2	67	3	100	3	100	89
45	Boma Mwangala	3	100	3	100	3	100	100
46	Jackline Masiye	3	100	3	100	3	100	100
47	Bo Salufu	3	100	3	100	3	100	100
48	Namakando	3	100	3	100	3	100	100
49	Namatama Silimbani	2	67	3	100	3	100	89
50	Bo Mungole	3	100	3	100	3	100	100
51	Sandongo Muzungu	2	67	3	100	3	100	89
52	Hellen Kafulo	2	67	3	100	3	100	89
53	Victor Musilizo	2	67	3	100	3	100	89
54	Nalisa Mubita	3	100	3	100	3	100	100

55	Fred Sibeso	2	67	2	67	2	67	67
56	Boma Billy	2	67	3	100	3	100	89
57	Masiliso Muzungu	2	67	3	100	3	100	89
58	Josephat Siyanga	3	100	3	100	3	100	100
59	Oliver Simasiku	3	100	3	100	3	100	100
60	Anna Mate	3	100	3	100	3	100	100

12.3 RANK ORDER OF THE HOUSEHOLD IN NAMAPANDE COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	1
2	33	2
3	33	5
4	33	7
5	33	12
6	33	20
7	33	21
8	33	22
9	33	30
10	33	40
11	44	4
12	44	9
13	44	10
14	44	11
15	44	16
16	44	31
17	44	32
18	55	43
19	67	3
20	67	6
21	67	13
22	67	18
23	67	28
24	67	39

25	67	55
26	77	19
27	78	8
28	78	15
29	78	17
30	78	27
31	78	38
32	89	23
33	89	25
34	89	34
35	89	41
36	89	44
37	89	49
38	89	51
39	89	52
40	89	53
41	89	56
42	100	57
43	100	14
44	100	24
45	100	26
46	100	29
47	100	33
48	100	35
49	100	36
50	100	37
51	100	42
52	100	45
53	100	46
54	100	47
55	100	48
56	100	50
57	100	54
58	100	58
59	100	59
60	100	60

13. WEALTH RANKING IN CANDELA COMMUNITY

13.1 RECORDING RESPONSES OF WEALTH RANKINGS IN CANDELA COMMUNITY

INFORMANT 1	
Informant:	MARTHA SIMANGOLWA
Sex:	FEMALE
Age:	51
Neighbourhood:	CANDELA
Assistant:	MASIYE NSONGA
Date:	25/05/2015
Level 1 (Richest) :	1, 3, 4, 5, 6, 7, 8, 9, 12, 14
Level 2 (Medium):	2, 11, 13, 22, 24, 25, 26
Level 3 (Poorest):	10, 17, 21, 23, 27
COMMENTS	
<p>Well-being Level 1 People in this group own farming implements and oxen and big farms of around 5 – 6 hectares. They also do businesses of selling groceries in their shops. Others own vehicles used for transport businesses. They own cattle of around 12 and above and goats of around 10 to 50.</p> <p>Well-being Level 2 The majority of people in this group are fishermen. Only a few have farming implements. They own fields of around 3 to 4 hectares and have 1 or 2 cattle. Some of them do not own any cattle but can afford to hire cattle owners to plough their fields from the money raised from their small businesses. However, they cannot afford to hire labourers to work in their fields because they have limited sources of income.</p> <p>Well-being Level 3</p>	

People in this group do not own any farming implements. They cultivate very small farm lands because they do not own any oxen neither do they own farming implements. They also buy and sell fish in the local markets though earning form the fish sales are not high.

INFORMANT 2	
Informant:	BOYD SITALI
Sex:	MALE
Age:	42
Neighbourhood:	CANDELA
Assistant:	MASIYE NSONGA
Date:	25/05/2015
Level 1 (Richest):	1, 3, 4, 6, 8, 12, 18, 19 20
Level 2 (Medium):	2, 5, 7, 9, 24
Level 3 (Lowest):	10, 11, 13, 14, 15, 16, 17, 21, 22, 23, 25, 26, 27
COMMENTS	
<p>Well-being Level 1 People in this group own cattle and farming implements. They also own oxen that they use for farming purposes. They also own bigger farm lands and sale their food crop. They also own goats that they sell. Some also own vehicles used for transport purposes.</p>	
<p>Well-being Level 2 They own farm lands and a few cattle. They also have farming implements. They also do some fishing businesses of buying and selling of fish. Some of them own one or so fishing nets used to catch fish for sell.</p>	
<p>Well-being Level 3</p>	

People in this group do a lot of day labour to survive. They also burn and sell charcoal for sale. A few of the people in this group do a bit of farming while others wait for handouts.

INFORMANT 3	
Informant:	NAMATAA KALUMBA
Sex:	MALE
Age:	56
Neighbourhood:	CANDELA
Assistant:	MASIYE NSONGA
Date:	25/05/2016
Level 1 (Richest):	1, 4, 6, 8, 18
Level 2 (Medium):	2, 3, 7, 11, 12, 13, 14, 16, 19, 20, 24
Level 3 (Lowest):	5, 9, 10, 15, 17, 21, 22, 23, 25, 26, 27
COMMENTS	
<p>Well-being Level 1 People in this group own farming implements used to farm their fields. Their fields are around 6 hectares in size. They also use their farming implements to make money by hiring them out to people without farming implements. They also sell cattle if in dire need of money especially for children's school fees and paying for hospital bills.</p>	
<p>Well-being Level 2 People in this group are fishermen in the businesses of catching and selling fish. They are also crop growers owning fields of 2 to 3 hectares. People in this group do not have farming implements neither do they own oxen. However, they can afford to hire labourers to work in their fields from the money they make from crop produce.</p>	
<p>Well-being Level 3</p>	

The majority of people in this group trade in charcoal. They burn and sale charcoal at very low prices making marginal profits due to limited market opportunities. They sell fish locally to earn incomes for home consumption. They own small fields and produce food which is not sufficient to last them the entire year.

13.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN CANDELA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Namataa Kalumba	1	33	1	33	1	33	33
2	Maiza Punda	2	67	2	67	2	67	67
3	Sikakwa Monze	1	33	1	33	2	67	44
4	Mortomola Njekwa	1	33	1	33	1	33	33
5	Musialike Tom	1	33	2	67	3	100	67
6	Cholwe Mwiida	1	33	1	33	1	33	33
7	Michelo Siamaluma	1	33	2	67	2	67	44
8	Ngalande Bombasa	1	33	1	33	1	33	33
9	Haabuka Siatwembe	1	33	2	67	3	100	67
10	Njekwa Sikanda	3	100	3	100	3	100	100
11	Mweembe Siansangu	2	67	3	100	2	67	78
12	Bobo Siatwembe	1	33	1	33	2	67	44
13	Sibanjene Mwiinde	2	67	3	100	2	67	78
14	Martha Simangolwa	1	33	3	100	2	67	67
15	Banji Mwindilila	1	33	3	100	3	100	78
16	Morgan Siansangu	1	33	3	100	2	67	67
17	Maurice Cheelo	3	100	3	100	3	100	100
18	James Sikanda	1	33	1	33	1	33	33
19	Josiah Masiya	1	33	1	33	2	67	44
20	Himaluma Himaluma	1	33	1	33	2	67	44
21	Beauty Masiya	3	100	3	100	3	100	100
22	Beusta Chiika	2	67	3	100	3	100	89
23	Beauty Choongo	3	100	3	100	3	100	100
24	Fred Mutongomani	2	67	2	67	2	67	67

25	Inambao Nyambe	2	67	3	100	3	100	89
26	Mangaliso Ngwenya	2	67	3	100	3	100	89
27	Boyd Sitali	3	100	3	100	3	100	100

13.3 RANK ORDER OF THE HOUSEHOLD IN CANDELA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	1
2	33	4
3	33	6
4	33	8
5	33	18
6	44	3
7	44	7
8	44	12
9	44	19
10	44	20
11	67	2
12	67	5
13	67	9
14	67	14
15	67	16
16	67	24
17	78	11
18	78	13
19	78	15
20	89	22
21	89	25
22	89	26
23	100	10
24	100	17
25	100	21
26	100	23
27	100	27

14. WEALTH RANKING IN SIANKANDE COMMUNITY

14.1 RECORDING RESPONSES OF WEALTH RANKINGS IN SIANKANDE COMMUNITY

INFORMANT 1	
Informant:	JOHN SIACHIKA
Sex:	MALE
Age:	43
Neighbourhood:	SIANKANDE
Assistant:	MASIYE NSONGA
Date:	20/04/2014
Level 1 (Richest) :	1, 4, 5, 10, 12, 15, 27
Level 2 (Medium):	2, 3, 6, 7, 8, 13, 14, 16, 17, 18, 19, 20, 22, 23, 24, 25, 28
Level 3 (Poorest):	9, 11, 21, 26, 29, 30, 31, 32
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p>	
<p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 or 3. They also own plough used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p>	
<p>Well-being Level 3</p>	

People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.

INFORMANT 2	
Informant:	CLEMENT CHIKA
Sex:	MALE
Age:	45
Neighbourhood:	SIANKANDE
Assistant:	MASIYE NSONGA
Date:	20/04/2014
Level 1 (Richest):	4, 5, 8, 10, 12, 15, 16, 19, 20, 22, 25, 27, 28
Level 2 (Medium):	1, 7, 9, 11, 13, 14, 17, 18, 21, 26, 29, 31
Level 3 (Lowest):	2, 3, 6, 23, 24, 30, 32
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p>	
<p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 to 3. They also own ploughs used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p>	
<p>Well-being Level 3</p>	

People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs to cultivate their fields. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.

INFORMANT 3	
Informant:	AGNESS NYAMBE
Sex:	FEMALE
Age:	28
Neighbourhood:	SIANKANDE
Assistant:	MASIYE NSONGA
Date:	20/04/2014
Level 1 (Richest):	1, 4, 5, 6, 10, 12, 15, 21, 23, 25, 27, 28
Level 2 (Medium):	2, 3, 7, 8, 11, 13, 14, 16, 17, 18, 22, 24, 26, 29
Level 3 (Lowest):	9, 19, 20, 30, 31, 32
COMMENTS	
<p>Well-being Level 1 Some of the people in this group own grinding mills. Some own cattle of around 10 and above. They also own 3 to 4 ploughs that are hired out to people during the cultivating time. Because they own many ploughs, they are able to plough big fields of around 4 hectares. They also own goats of around 7 to 8 and they own pigs around 5.</p> <p>Well-being Level 2 Some of the people in this group own cattle amounting to 2 to 3. They also own ploughs used for cultivating their land. Their fields are fairly big ranging from 1 to 2 hectares. They also own goats of 4 to 5, a few pigs and they also own few chickens.</p> <p>Well-being Level 3</p>	

People in this group survive by depending on others. They do not own any cattle and do not own any ploughs. They cultivate smaller fields and borrow ploughs from people that own ploughs to cultivate their fields. Some do day labour in other people's fields to survive. Some own 2 goats and they also own a few chickens.

14.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN SIANKANDE COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	David Simasiku	1	33	2	67	1	33	44
2	Geofrey Chimbwizu	2	67	3	100	2	67	78
3	Benson Nyambe	2	67	3	100	2	67	78
4	Jackson Malambo	1	33	1	33	1	33	33
5	Janette Lumba	1	33	1	33	1	33	33
6	Mahapelela Kayondo	2	67	3	100	1	33	67
7	Pumulo Simasiku	2	67	2	67	2	67	67
8	Clement Chika	2	67	1	33	2	67	57
9	Malita Chika	3	100	2	67	3	100	89
10	Shadrek Nyambe	1	33	1	33	1	33	33
11	John Siachika	3	100	2	67	2	67	78
12	Vasco Nyambe	1	33	1	33	1	33	33
13	Nawa Lyambela	2	67	2	67	2	67	67
14	Sitimba Kamitondo	2	67	2	67	2	67	67
15	Mushabati Muulu	1	33	1	33	1	33	33
16	David Chilambwe	2	67	1	33	2	67	57
17	Oscar Simasiku	2	67	2	67	2	67	67
18	Morgan Simasiku	2	67	2	67	2	67	67
19	Agness Nyambe	2	67	1	33	3	100	67
20	Bridget Nyambe	2	67	1	33	3	100	67
21	Josephine Nyambe	3	100	2	67	1	33	67
22	Given Nyambe	2	67	1	33	2	67	57
23	Mary Chilambwe	2	67	3	100	1	33	67
24	Sandila Moonga	2	67	3	100	2	67	78

25	Habeenzu Moonga	2	67	1	33	1	33	44
26	Rosemary Sianamwe	3	100	2	67	2	67	78
27	Namasiku Mubita	1	33	1	33	1	33	33
28	Lazarus Nzwenga	2	67	1	33	1	33	44
29	Samson Nyambe	3	100	2	67	2	67	78
30	Chombwe Simbelele	3	100	3	100	3	100	100
31	James Nyambe	3	100	2	67	3	100	89
32	Kelvin Musiwa	3	100	3	100	3	100	100

14.3 RANK ORDER OF THE HOUSEHOLD IN SIANKANDE COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	4
2	33	5
3	33	10
4	33	12
5	33	15
6	33	27
7	44	1
8	44	25
9	44	28
10	57	8
11	57	16
12	57	22
13	67	6
14	67	7
15	67	13
16	67	14
17	67	17
18	67	18
19	67	19
20	67	20
21	67	21
22	67	23

23	78	2
24	78	3
25	78	11
26	78	24
27	78	26
28	78	29
29	89	9
30	89	31
31	100	30
32	100	32

15. WEALTH RANKING IN MWANDI CENTRAL COMMUNITY

15.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MWANDI CENTRAL COMMUNITY

INFORMANT 1	
Informant:	MASIYE NSONGA
Sex:	MALE
Age:	21
Neighbourhood:	MWANDI CENTRAL
Assistant:	MASIYE NSONGA
Date:	20/05/2015
Level 1 (Richest) :	1, 7, 20, 21, 23, 24, 32
Level 2 (Upper Middle):	8, 22, 25, 30, 31, 37, 38
Level 3 (Lower Middle):	2, 3, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 26, 27, 28, 29, 33, 34, 40, 41, 42, 43, 45, 48

Level 4 (Poorest):	4, 5, 18, 35, 36, 39, 44, 46, 47, 49, 50
COMMENTS	
<p>Well-being Level 1 This group comprises of civil servants, large shop owners and Taxi drivers. They all live in houses roofed with iron sheets. Their houses are made of bricks and they have electricity. Some of them have vehicles while others are able to sustain themselves through shop businesses. Others have cattle that range from 20 – 50 and are able to send their children to better schools.</p>	
<p>Well-being Level 2 This group is composed of fish sellers, artisans, blacksmiths, cleaners and fishermen. They live in mud and pole houses that are roofed with iron sheets and have electricity. They generate their income from day labours, and cleaning at the hospital. Others have businesses of selling sweet potatoes whilst others are cooks at the OVC project. Their major source of income comes from lending money which is received back with interest. They do not keep any livestock.</p>	
<p>Well-being Level 3 Comprises beer sellers (local brew), small livestock keepers i.e. poultry and goats, gardening, marketers selling scorns and buns. They make money through brewing and selling of beer though their incomes are lower than that of group 2. They work all year round to make little money. Their houses are made of mud and poles</p>	
<p>Well-being Level 4 Comprise old men and women. Some of them are widows who rely on subsistence farming and help from churches and extended families to survive. They do keep chickens not meant for sale, but consumption. If they sale, it means they need to buy necessities such as cooking oil or salt and sugar. They have no cattle and mostly rely on hand hoes to cultivate their fields. They have and cultivate small farm areas because they lack equipment. The old men normally go fishing just to provide meals for families. Their demand for food is high because they have big families to feed especially orphaned children. They live in mud and pole houses.</p>	

INFORMANT 2	
Informant:	MWAKA SITALI
Sex:	FEMALE
Age:	62

Neighbourhood:	MWANDI CENTRAL
Assistant:	MASIYE NSONGA
Date:	20/05/2015
Level 1 (Richest):	1, 5, 7, 20, 21, 22, 23, 24, 25, 30, 31, 32, 33, 34, 38
Level 2 (Medium):	3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 26, 27, 29, 35, 37, 40, 41, 43, 45, 46, 48, 49, 50
Level 3 (Lowest):	2, 6, 28, 36, 39, 42, 44, 47
COMMENTS	
<p>Well-being Level 1 They work for themselves – own shops. Their children send them money. They are also able to send children to school. Some have more than 20 cattle. They have big fields and usually have good yields because they use farming implements. They engage people to work in their fields. They have three meals a day. Their houses are constructed of bricks. Some own houses that are rented out to tenants. Other people own butcheries, guest houses and bottle stores. Some also own vehicles. Their houses have electricity</p> <p>Well-being Level 2 They are able to find food to eat but they do hard work weeding in other people’s fields to get food. They are also engaged in beer selling and fish to earn incomes. Some have small projects e.g. with pigs that are not very profitable. They do not have farming implements so they have to work in fields for other people with farming implements so that in turn, they can plough their fields. Some have brick houses though others have mud and pole houses. Their houses do not have electricity. They do not own any cars, goats and cattle. A few do day labour of fishing.</p> <p>Well-being Level 3 People in this group receive meals from the World Renewal Project as part of reducing hunger in the community. They do not own any cattle, neither do they own goats. They own small farm lands but they do not utilize the land because they do not have farm implements and crops inputs. Old women in this group are sometimes given maize to eat but sometimes fail to raise money to have the maize ground at the hummer mills due to lack of incomes. They are usually hungry and produce little food. They mostly have one meal in a day and cannot afford to eat all three.</p> <p style="text-align: center;">Additional Comments</p> <p>People in group 1 are not affected by floods because their houses and farm lands are not situated in flood prone areas or near the river. People in group 1 do farming yearly because they are used to that kind of lifestyle. Otherwise, when there is a drought, they rely on other alternative forms of livelihoods for survival because they can afford it.</p>	

Support from institutional source targets the aged people and vulnerable in the community. Identifying such kinds of groups is done using section leaders; and confirmation is done on the ground by supporting institutions.

INFORMANT 3	
Informant:	INAMBAO KAONGOLA
Sex:	MALE
Age:	44
Neighbourhood:	MWAND CENTRAL
Assistant:	MASIYE NSONGA
Date:	20/05/2015
Level 1 (Richest):	1, 3, 7, 8, 16, 20, 21
Level 2 (Upper Middle):	23, 24, 25, 31, 32, 33, 34
Level 3 (Lower Middle):	9, 10, 11, 12, 13, 14, 15, 19, 22, 26, 28, 29, 30, 40, 41, 46
Level 4 (Lowest):	2, 4, 5, 6, 17, 18, 27, 35, 36, 37, 38, 39, 42, 43, 44, 45, 47, 48, 49, 50
COMMENTS	
<p>Well-being Level 1 Most people in this group are employed by the government. People in group 1 get monthly incomes so they do not face difficulties. They are able to get loans from the banks to improve their wellbeing. Some people in this group own cattle that are used for farming. Some use salaries from their work places to invest in agriculture or farming. Some own vehicles</p> <p>Well-being Level 2 Some people in this group are business people though their income is not regular. Some own shops, whereas others own cars that are used in transport business. Some people in this group own land of about 4 to 5 hectares. People in this group own ploughs that they use for cultivating their fields. They can afford to have all three meals in a day. A few have cattle.</p>	

Well-being Level 3

People in this group make fritters, scones and brew beer for sale. They do not make enough money from their small sales. Some of them are supported by the OVC project to support their children go to school. Some of them have small pieces of land where they farm. They also pay people with ploughs to till their fields because they do not own any cattle or farming implements.

Well-being Level 4

People in this group collect firewood and sell it. Some get reeds from the river and sell it for a little money. When rivers are flooded, they catch small fish and sell it locally. They also survive by doing day labour in other people's fields and also day labour of separating big fish from small ones from people who fish for a living and those people with fishing nets. Usually, their payment is in terms of food. They also raise big families of children that are orphaned. They can only afford to eat meals twice a day.

15.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN MWANDI CENTRAL COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Boma Boyd	1	25	1	33	1	25	28
2	Boma Sitali	3	75	3	100	4	100	92
3	Boma Deborah	3	75	2	67	1	25	56
4	Boma Simonda	4	100	2	67	4	100	89
5	Boma Simonda Grace	4	100	1	33	4	100	78
6	Boma Kanchule	3	75	3	100	4	100	92
7	Mr. Matindo	1	25	1	33	1	25	28
8	Boma Mildred	2	50	2	67	1	25	47
9	Bo Lwendo	3	75	2	67	3	75	72
10	Bo Manga Mangalangala	3	75	2	67	3	75	72
11	Boma Moses	3	75	2	67	3	75	72
12	Mr. Mutaba	3	75	2	67	2	50	64
13	Boma Yorum	3	75	2	67	3	75	72
14	Bo Esnart	3	75	2	67	3	75	72
15	Mr. Sampaya	3	75	2	67	3	75	72
16	Boma Nkazi	3	75	2	67	1	25	56

17	Boma Mazinza	3	75	2	67	4	100	81
18	Boma Jeremiah	4	100	2	67	4	100	89
19	Boma Mukwazo	3	75	2	67	3	75	72
20	Mr. Chilulu	1	25	1	33	1	25	28
21	Mr. Nalishuwa Maikabo	1	25	1	33	1	25	28
22	Bo Chuma	2	50	1	33	3	75	53
23	Mr. Bond	1	25	1	33	2	50	36
24	Mr. Ian	1	25	1	33	2	50	36
25	Boma Chidoma	2	50	1	33	2	50	44
26	Boma Majorie	3	75	2	67	3	75	72
27	Boma Monde	3	75	2	67	4	100	81
28	Boma Chibwe	3	75	3	100	3	75	83
29	Boma Sishekano	3	75	2	67	3	75	72
30	Mercy Lukala	2	50	1	33	3	75	53
31	Mr. Sydney	2	50	1	33	2	50	44
32	Mr. Simasiku	1	25	1	33	2	50	36
33	Boma Boyd	3	75	1	33	2	50	53
34	Inambao Lubinda	3	75	1	33	2	50	53
35	Ma Mawara	4	100	2	67	4	100	89
36	Nsala Sibe	4	100	3	100	4	100	100
37	Mr. Sikili Moses	2	50	2	67	4	100	72
38	Mr. Bernard	2	50	1	33	4	100	61
39	Bo Kuku Chansi	4	100	3	100	4	100	100
40	Kalema	3	75	2	67	3	75	72
41	Boma Kufunduka (Lwendo)	3	75	2	67	3	75	72
42	Sikombwambwi Siloka	3	75	3	100	4	100	92
43	Sharon Mwekezo Kasaila	3	75	2	67	4	100	81
44	John Mowa	4	100	3	100	4	100	100
45	Maketo Simukombo	3	75	2	67	4	100	81
46	Regina Kanoti	4	100	2	67	3	75	81
47	Ngweze Simasiku	4	100	3	100	4	100	100
48	Mr. Lilungwe	3	75	2	67	4	100	81
49	Kabuyobuyo Kwalombota	4	100	2	67	4	100	89
50	Sandra Matokwani	4	100	2	67	4	100	89

15.3

RANK ORDER OF THE HOUSEHOLD IN MWANDI CENTRAL COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	28	1
2	28	7
3	28	20
4	28	21
5	36	23
6	36	24
7	36	32
8	44	25
9	44	32
10	47	8
11	53	22
12	53	30
13	53	33
14	53	34
15	56	3
16	56	16
17	61	38
18	64	12
19	72	9
20	72	10
21	72	11
22	72	13
23	72	14
24	72	15
25	72	19
26	72	26
27	72	29
28	72	37
29	72	40
30	72	41
31	78	5
32	81	17

33	81	27
34	81	43
35	81	45
36	81	46
37	81	48
38	83	28
39	89	4
40	89	18
41	89	35
42	89	49
4	89	50
44	92	2
45	92	6
46	92	42
47	100	36
48	100	39
49	100	44
50	100	47

16. WEALTH RANKING IN MULOMBWE – KASAYA COMMUNITY

16.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MULOMBWE – KASAYA COMMUNITY

INFORMANT 1	
Informant:	BENADATE NG'ANDWE
Sex:	FEMALE
Age:	32

Neighbourhood:	MULOMBWE – KASAYA
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest) :	3, 10, 12, 21
Level 2 (Upper Middle):	2, 4, 6, 11, 13
Level 3 (Lower Middle):	5, 7, 8, 14, 16, 20, 22, 27
Level 3 (Poorest):	1, 9, 15, 17, 18, 19, 23, 24, 25, 26
COMMENTS	
<p>Well-being Level 1 People in this group own shops and have cattle of around 7 – 10. They also have vehicles used for transporting business. People in this group also have goats ranging from 20-40 and sheep amounting to 3. They also own pigs ranging from 10 – 15. They also rear chickens for sale and home consumption. Their houses are made of mud and pole houses, roofed with iron sheets and electrified. People in this group also own farm lands though they do not grow a lot of crops because of poor soils. People in this group can afford to have three meals in a day. They are also able to take their children to school.</p> <p>Well-being Level 2 People in this group own cattle around 7 or less and goats of around 7 or less. Their houses are made of mud and poles and roofed with iron sheets. People in this group can afford to have all three meals in a day. People in this group are also able to take their children to school through their small businesses of fish selling.</p> <p>Well-being Level 3 People in this group sell small amounts of fish and they can afford to send their children to school through such businesses. People in this group also do day labours to earn an income.</p> <p>Well-being Level 4 People in this group are poor and usually supported by their children outside the community. Some also survive on doing day labours. People in this group can only afford to have one meal a day. This group is mainly characterized by elderly people.</p>	

INFORMANT 2	
Informant:	CHUMA SIMATE
Sex:	FEMALE
Age:	30
Neighbourhood:	MULOMBWE – KASAYA
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest):	12, 21
Level 2 (Upper Middle):	2, 3, 5, 10, 21
Level 3 (Lower Middle):	4, 6, 7, 11, 13, 16, 19, 23, 27
Level 4 (Lowest):	1, 8, 9, 14, 15, 17, 18, 20, 22, 24, 25, 26
COMMENTS	
<p>Well-being Level 1 People in this group own businesses (shops and cattle selling) and they have houses that they rent out. Their cattle range from 50 – 70 in number. They also have goats and sheep ranging from 20 – 30 and 5 – 8 each, respectively. Their houses are made of brick where as others hand have and pole houses, with iron sheets. They can afford to have three meals in a day and are able to take their children to school. Some of them also own vehicles that are used as public transport.</p>	
<p>Well-being Level 2 People in this group have businesses of buying and selling fish. They also have very small grocery shops. Some of them are in the business of selling fuel. They own a few goats ranging from 15 – 20. Others have pigs ranging from 3 – 5. Their houses are made of mud and pole houses with iron sheets. They can afford to have three meals in a day</p>	
<p>Well-being Level 3</p>	

People in this group survive doing day labours in fishing. They borrow other people's fishing nets and use to catch fish for sale. Some of them brew local beer for sale. They usually struggle to make incomes. Some of them buy and resell chickens in Kazungula. Their houses are made of much and poles and thatched roofs. They can afford to have two meals in a day.

Well-being Level 4

People in this group comprise of old ladies and men who rely on piece-works for weeding in people's farms and plastering houses. Some work for fishermen removing fish from the nets to be given a handful of fish for relish. Sometimes, a whole day goes by without having food for their stomachs.

INFORMANT 3	
Informant:	NAMUSHI MULWAZI
Sex:	FEMALE
Age:	27
Neighbourhood:	MULOMBWE – KASAYA
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest):	3, 12
Level 2 (Upper Middle):	2, 4, 10, 11, 13, 14, 20, 21, 22
Level 3 (Lower Middle)	1, 5, 6, 7, 16, 17, 19, 23, 24, 25, 27
Level 3 (Lowest):	9, 15, 18, 26
COMMENTS	
<p>Well-being Level 1 People in this group own cattle ranging from 50 – 70. People in this group also own goats from 50 – 70. A few people in this group also own cars and shops. Their houses are made of bricks, mud and poles. People in this group can afford to have three meals in a day</p>	

Well-being Level 2

People in this group do day labour and also buying and selling fish. People in this group can also afford to have three meals in a day. Other people in this group lived in thatched houses. Some live in mud and pole houses with iron roofing.

Well-being Level 3

People in this group borrow fishing nets to catch fish for food. People in this group also do piece weeks. People in group live in thatched houses.

Well-being Level 4

People in this group comprise of old women and men that rely on family members for support.

16.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN MULOMBWE – KASAYA COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Edwin Manganje	4	100	4	100	3	75	92
2	Nasilele Kabango	2	50	2	50	2	50	50
3	Sakulo Zuze	1	25	2	50	1	25	33
4	Matata Mwendekwa	2	50	3	75	2	50	58
5	Benadate Ngandwe	3	75	2	50	3	75	67
6	Masiliso Kabali	2	50	3	75	3	75	67
7	Grace Namasiku Simonda	3	75	3	75	3	75	75
8	Mutinta Mulwazi	3	75	4	100	2	50	75
9	Masauso Nosiku	4	100	4	100	4	100	100
10	Chisala Zuze	1	25	2	50	2	50	42
11	Aplane Mulwazi	2	50	3	75	2	50	58
12	Kalaluka Kalaluka	1	25	1	25	1	25	25
13	Jani Mulwazi	2	50	3	75	2	50	58
14	Letty Mukokobi	3	75	4	100	2	50	75
15	Vincent Mwiya	4	100	4	100	4	100	100
16	Beatrice Chinunka	3	75	3	75	3	75	75
17	Mukokobi Mukokobi	4	100	4	100	3	75	92

18	Pumulo Nawa	4	100	4	100	4	100	100
19	Simasiku Nyambe	4	100	3	75	3	75	83
20	Purity Mulwazi	3	75	4	100	2	50	75
21	Mutumba Katukula	1	25	1	25	2	50	33
22	Mwiza Nyambe	3	75	4	100	2	50	75
23	Mubita Kalaluka	4	100	3	75	3	75	83
24	Mulwazi Mulwazi	4	100	4	100	3	75	92
25	Sililo Sililo	4	100	4	100	3	75	92
26	Steven Nawa	4	100	4	100	4	100	100
27	Namushi Mulwazi	3	75	3	75	3	75	75

16.3 RANK ORDER OF THE HOUSEHOLDS IN MULOMBWE – KASAYA COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	23	12
2	33	3
3	33	21
4	42	10
5	50	2
6	58	4
7	58	11
8	58	13
9	67	5
10	67	6
11	75	7
12	75	8
13	75	14
14	75	16
15	75	20
16	75	22
17	75	27
18	83	19
19	83	23

20	92	1
21	92	17
22	92	24
23	92	25
24	100	9
25	100	15
26	100	18
27	100	26

17. WEALTH RANKING IN MUKENGAMI COMMUNITY

17.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MUKENGAMI COMMUNITY

INFORMANT 1	
Informant:	JACK MUZUNGU
Sex:	MALE
Age:	58
Neighbourhood:	MUKENGAMI
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest) :	2, 3, 4, 5, 6, 10
Level 2 (Upper Middle):	1, 7, 8, 12, 13, 14, 17, 25, 27, 28
Level 3 (Lower Middle):	9, 11, 18, 21, 23, 24, 26, 29

Level 4 (Poorest):	16, 19, 20, 22, 20
COMMENTS	
<p>Well-being Level 1 Life for people in this group is better than for others because they are able to find a lot of things on their own. They have cattle about 10 and if they have a problem, they can afford to sell their cattle to resolve financial problems. They cultivate fields of around 4 – 5 hectares and produce enough food to last them the entire year. Some houses are good and made of bricks and iron sheets where as others still live in houses with mud and pole houses but with iron sheets. Most of them own bicycles though none own cars.</p>	
<p>Well-being Level 2 People in this group cannot be compared to people in group 1 because they are intermediate. Their farms are around 2 – 3 hectares. Their houses are made of mud and the roof thatched with grass. They own cattle of around 1 – 2. When farming, they have to be assisted by extended family members because they do not own any farming implements. They also face challenges paying for school fees for their children.</p>	
<p>Well-being Level 3 People in this group survive by getting help from others. They work for others in their farms tilling the land and weeding. Their major source of livelihood is through piecework.</p>	
<p>Well-being Level 4 This group comprise of aged people who have no people to assist them within the community. They practically get support from family members that live outside the village, though the support does not come often. So most of time, they stay hungry or go without food for extended periods of time.</p>	

INFORMANT 2	
Informant:	CASIUS MALUMO
Sex:	MALE
Age:	29
Neighbourhood:	MUKENGAMI
Assistant:	MASIYE NSONGA

Date:	21/05/2015
Level 1 (Richest):	1, 2, 3, 5, 17
Level 2 (Medium):	6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 21, 23, 24, 25, 26, 28, 29 30
Level 3 (Lowest):	4, 16, 20, 22
COMMENTS	
<p>Well-being Level 1 People in group 1 have cattle around 80 – 100. Their farm lands and fields are around 6 hectares. Their housing structures are made of bricks. Some of the people in this group own houses in Livingstone that are rented out to earn incomes. Their major sources of income come from farming activities. The cattle they own are also used as drought power during farming periods. They also slaughter cattle for sale to earn incomes.</p> <p>Well-being Level 2 People in this group borrow cattle from people that have to cultivate their fields and land. Farming is done for food and not for sale. The majority of people in this group do not own any cattle. Those that own cattle own around 1 – 2. They burn charcoal and sell it to earn incomes. Sometimes, out of the money they earn from selling charcoal, they are able to maize for resale.</p> <p>Well-being Level 3 Some of the people in this group have no source of income at all. They rely on hand outs for survival.</p>	

INFORMANT 3	
Informant:	ANGELINA NGONGOLA
Sex:	FEMALE
Age:	52
Neighbourhood:	MUKENGAMI
Assistant:	MASIYE NSONGA

Date:	21/05/2015
Level 1 (Richest):	1, 2, 3, 4, 5, 6, 10, 17
Level 2 (Upper Middle):	7, 14, 15, 19, 25
Level 3 (Middle)	21, 27, 28, 29
Level 4 (Lower Middle)	8, 11, 26
Level 5 (Lowest):	9, 12, 13, 16, 18, 20, 22, 23, 24, 30
COMMENTS	
<p>Well-being Level 1 People in the group own uncountable cattle, goats and pigs. They also have big fields. When they harvest their crop produce, they are able to sell their crop produce and earn some money. They also take their cattle to town to be sold. Most of the people in this group live in brick houses. They also own property in town.</p> <p>Well-being Level 2 People in this group own property but they cannot be compared to those in group one. They also own pigs about 2 – 3 and cattle which could be about 4 – 5 but cannot reach the level of group one.</p> <p>Well-being Level 3 They own farms and some own farming implements. They also a few livestock.</p> <p>Well-being Level 4 People in this group own 1 cattle each and small plots of land.</p> <p>Well-being Level 5 People in this group have no livestock. They earn incomes by working in other people’s fields. Some people in this group depend on others for food.</p>	

**17.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING
IN MUKENGAMI COMMUNITY**

HH	Household Name
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No.		Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Jack Muzungu	2	50	1	33	1	20	34
2	Kenford Kamwi	1	25	1	33	1	20	26
3	Fabian Mukengami	1	25	1	33	1	20	26
4	Nelson Mukengami	1	25	3	100	1	20	48
5	Christine Mukengami	1	25	1	33	1	20	26
6	Asiva Mukengami	1	25	2	67	1	20	37
7	Brighton Kasonde	2	50	2	67	2	40	52
8	Casius Malumo	2	50	2	67	4	80	66
9	Jerry Hachimba	3	75	2	67	5	100	81
10	Binny Mukengami	1	25	2	67	1	20	37
11	Alexis Munkombwe	3	75	2	67	4	80	74
12	Ratio Kamwi	2	50	2	67	5	100	72
13	Offard Kamwi	2	50	2	67	5	100	72
14	Boyd Muzungu	2	50	2	67	2	40	52
15	Peter Kawile	2	50	2	67	2	40	52
16	Edward Belemu	4	100	3	100	5	100	100
17	Wilson Mukengami	2	50	1	33	1	20	34
18	Sialanga Aaron	3	75	2	67	5	100	81
19	Eustiaus Muzungu	4	100	2	67	2	40	69
20	Sophia Muleya	4	100	3	100	5	100	100
21	Beatrice Mukengami	3	75	2	67	3	60	67
22	Dorica Muchimba	4	100	3	100	5	100	100
23	Jiros Siabeene	3	75	2	67	5	100	81
24	Webby Chileshe	3	75	2	67	5	100	81
25	Kelvin Mufwambi	2	50	2	67	2	40	52
26	Maile Muzungu	3	75	2	67	4	80	74
27	Bridget Mukengami	2	50	2	67	3	60	59
28	Innocent Matali	2	50	2	67	3	60	59
29	Francesca Mukengami	3	75	2	67	3	60	67
30	Shatu Mafalali	4	100	2	67	5	100	89

17.3

RANK ORDER OF THE HOUSEHOLDS IN MUKENGAMI COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	26	2
2	26	3
3	26	5
4	34	1
5	34	17
6	37	6
7	37	10
8	48	4
9	52	7
10	52	14
11	52	15
12	52	25
13	59	27
14	59	28
15	66	8
16	67	21
17	67	29
18	69	19
19	72	12
20	72	13
21	74	11
22	74	26
23	81	9
24	81	18
25	81	23
26	81	24
27	89	30
28	100	16
29	100	20
30	100	22

18. WEALTH RANKING IN MAIBWE COMMUNITY

18.1 RECORDING RESPONSES OF WEALTH RANKINGS IN MAIBWE COMMUNITY

INFORMANT 1	
Informant:	VEMONT MWAWULUKA
Sex:	MALE
Age:	29
Neighbourhood:	MAIBWE
Assistant:	MASIYE NSONGA
Date:	23/05/2015
Level 1 (Richest) :	8, 9, 12, 17, 18
Level 2: (Upper middle)	3, 6, 7, 16
Level 3: (Lower middle)	4, 13, 14, 15
Level 4 (Poorest):	1, 2, 5, 10, 11
COMMENTS	
<p>Well-being Level 1 They have lots of cattle. Have lots of good progressive ideas on business ventures that are productive. They make a lot of money from the sales of cattle and milk. They also hire out their animals to those who do not have to be use in ploughing the fields. This makes them earn extra than the rest of the people in the area. They have big fields of maize and cotton that they sale in town after harvest so they generally have more than enough. Maize grown is sufficient to feed their families throughout the year and the surplus is sold out. They also grow beans and sweet potatoes for home consumption and sale the surplus.</p> <p>Well-being Level 2</p>	

They engage in all business ventures they can get their hands on. However, the most prominent business they engage in is the buying of livestock – Chickens, pigs, goats from those who have a lot locally and resale in town at higher prices. Profit margins from the sales of livestock is only enough to keep them going, it's not much to enjoy a good life as compared to the people in level one. These people don't depend on hand outs from other people because they also labor in their gardens to grow vegetables to sale locally when livestock businesses are not doing well. Their fields are not very big because they have limited inputs like fertilizers and livestock manure because they don't own their own cattle for field nutrients and they always hire livestock to cultivate their fields because they don't own any.

Well-being Level 3

They labor in other people's fields as payment for use of livestock to cultivate their own fields. Sometimes, they labor for money and feed from the money they labor for. Their maize fields don't yield enough to last the whole year because they spend most of the food production time working in other people's fields neglecting their own fields. They don't have inputs like fertilizers and no one wants to loan them any money for fear of defaulting to pay back because they are poor and field produce is poor.

Well-being Level 4

These are very poor. They accept and beg for handouts from anyone. They have no livestock of their own; they even don't do any business of any nature because most of them are old and live alone with no children to help them. They don't produce any food and don't use their fields to grow anything in it.

INFORMANT 2	
Informant:	GRACE MATAKALA
Sex:	FEMALE
Age:	34
Neighbourhood:	MAIBWE
Assistant:	MASIYE NSONGA
Date:	23/05/2015
Level 1 (Richest):	3, 8, 9, 12, 13, 16, 17, 18
Level 2 (Upper Middle)	2, 7

Level 3 (Lower Middle):	1, 4, 5, 6, 10, 14, 15
Level 4 (Poorest):	11
COMMENTS	
<p>Well-being Level 1 They are rich in the village. They are able to solve any problem that befell their families because they can easily sale the animals they have and use the money to purchase what they don't have. In times of floods or droughts, they do not suffer like the rest of the villagers because their animals would be sold and money used to buy maize for consumption. Some still have maize in their storages from the previous farming season. They manage to cultivate their fields properly and yield lots of food because they don't incur costs of hiring livestock because they own livestock</p> <p>Well-being Level 2 They live better than people in group three, but not as well as those in level one. They have capital to start businesses. Those who lack make building blocks for sale. They also buy livestock – Chickens, pigs and goats locally and resale it in Livingstone, while some of it is sold locally. Their fields are cultivated by hiring faming equipment from those who have. They also hire oxen to plough their fields. They are not rich but also not poor because their families are sustained throughout the year from the businesses they engage in.</p> <p>Well-being Level 3 These are poor who depend on neighbors and well-wishers for survival. They don't cultivate and grow maize in their fields because they are old and don't have anyone to take care of them. Sometimes, village people and relatives cultivate these people's fields at no cost; just to enable them have something to eat for a few months. They don't own anything and their houses are in deplorable conditions mainly made of mud and logs. Their property is a few plate and old worn out clothes.</p> <p>Well-being Level 4 These are the poorest in the society who fail to sustain themselves through any means. They depend on others for food and clothing and may go for days without food if no one comes to their aid</p>	

INFORMANT 3	
Informant:	FRANK MUHANGA
Sex:	MALE
Age:	26

Neighbourhood:	MAIBWE
Assistant:	MASIYE NSONGA
Date:	23/05/2015
Level 1 (Richest):	3, 8, 12, 16, 18
Level 2 (Upper middle):	4, 5, 7, 9, 13, 17
Level 3 (Lower middle)	1, 2, 6, 14
Level 4 (Lowest):	10, 11, 15
COMMENTS	
<p>Well-being Level 1 They own cattle and have personal ploughs. They have enough to eat and the surplus for sale. In times of drought or flooding, they still don't go hungry because they can sale livestock from their kraals and still buy food to eat. They hire out their animals to cultivate other people's fields.</p> <p>Well-being Level 2 They have capital to invest in businesses. They buy fish from fishermen and resale it within their villages. Those who realize a lot of profit from fish sales invest in livestock business. They buy chickens, goats and pigs locally and resale it in towns at higher prices. They hire animals from those who have to cultivate their fields. Their fields are not very big because paying for the use of oxen to cultivate large fields is very expensive. In good harvest years, they don't run short of food for the entire year.</p> <p>Well-being Level 3 These are the unmarried women who beg from cattle owners to use their animals to cultivate their fields. They run small businesses selling cooked groundnuts and fritters and live on labouring in other people's fields to earn money. Their fields are not big because their households are small. They grow vegetables that they sale door to door locally.</p> <p>Well-being Level 4 These are old and sickly people who have nothing to eat. They don't own any property except for small mats in their houses where they sleep. They don't have any cattle and do no farming. These do not engage in any business ventures because they have no capital to invest and do not have the strength to work.</p>	

**18.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING
IN MAIBWE COMMUNITY**

HH No.	Household Name	Well-being level assigned according to informant						
		INF 1 (4)	INF 1 SCORE	INF 2 (4)	INF 2 SCORE	INF 3 (4)	INF 3 SCORE	AVERAGE SCORE
1	Kondowe Peter	4	100	3	75	3	75	83
2	Boston Silwiza	4	100	2	50	3	75	75
3	Vemont Mwawuluka	2	50	1	25	1	25	33
4	Silvia Likambenji	3	75	3	75	2	50	67
5	Nomayi Kamono	4	100	3	75	2	50	75
6	Mondoka Emmanuel	2	50	3	75	3	75	67
7	Beatrice Siulapwa	2	50	2	50	2	50	50
8	Frank Muhanga	1	25	1	25	1	25	25
9	Mutinta Mutinta	1	25	1	25	2	50	33
10	Grace Matakala	4	100	3	75	4	100	92
11	Michelo Hamoonga	4	100	4	100	4	100	100
12	Kapala Kangombe	1	25	1	25	1	25	25
13	Namuunza Kamona	3	75	1	25	2	50	50
14	David Siamweemba	3	75	3	75	3	75	75
15	Dunbar Hambinzi	3	75	3	75	4	100	83
16	Philip Makayi	2	50	1	25	1	25	33
17	Derick Kabandi	1	25	1	25	2	50	33
18	Charles Likambi	1	25	1	25	1	25	25

18.3 RANK ORDER OF THE HOUSEHOLD IN MAIWE COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	25	8
2	25	12
3	25	18
4	33	3
5	33	9

6	33	16
7	33	17
8	50	7
9	50	13
10	67	4
11	67	6
12	75	2
13	75	5
14	75	14
15	83	1
16	83	15
17	92	10
18	100	11

19. WEALTH RANKING IN TOMU-MUYAMBANGO COMMUNITY

19.1 RECORDING RESPONSES OF WEALTH RANKINGS IN TOMU-MUYAMBANGO COMMUNITY

INFORMANT 1	
Informant:	KALALUKA NAWA
Sex:	MALE
Age:	28
Neighbourhood:	TOMU-MUYAMBANGO
Assistant:	MASIYE NSONGA
Date:	26/05/2015

Level 1 (Richest) :	1, 3, 8
Level 2 (Medium):	2, 4, 7, 9, 10, 14
Level 3 (Poorest):	5, 6, 11, 12, 13
COMMENTS	
<p>Well-being Level 1 They are rich. They own a lot of property like buses, workshops and small vehicles. They also own a lot of cattle that they usually sale to buy vehicles and field implements. They have big fields where they grow maize, groundnuts and cotton. Sometimes they sale the surplus and earn extra money to supplement the businesses they are running. They eat well and are self-sufficient. They always have ideas for new business investments and have managed to live a comfortable life.</p> <p>Well-being Level 2 They afford to have 2 decent meals daily and sometimes 3. They do not have sufficient resources to live well like the businessmen/women in level 1 who eat nutritious foods like meat. They cultivate and plant small maize fields because they do not have cattle to cultivate their fields and don't grow enough crops. Their land is too small to grow lots of crops.</p> <p>Well-being Level 3 These are the aged and some households run by widowed women who don't have any money and don't own property. Widows and their children labour in other people's fields and are paid small amount of money to buy mealie meal or maize. Others labour in market places by carrying and loading traders' baggage on and off tracks to market places. From these activities, they earn very little, just enough to live for that day. Accepting handouts from well to do community members is what they live on. They also beg for second hand clothes. Their houses are made of logs and in very poor and deplorable conditions.</p>	

INFORMANT 2	
Informant:	MUNDIA NAWA
Sex:	MALE
Age:	35
Neighbourhood:	TOMU-MUYAMBANGO

Assistant:	MASIYE NSONGA
Date:	26/05/2015
Level 1 (Richest):	1, 3, 7, 13
Level 2 (Medium):	2, 4, 5, 6, 8, 9, 10
Level 3 (Lowest):	11, 12
COMMENTS	
<p>Well-being Level 1 Most of these people are businessmen and women operating public transport services and selling livestock to town. Others are small scale entrepreneurs, selling household commodities. They have the money to buy enough food every year and never sleep on hungry stomachs. They are also subsistence farmers who grow enough maize to eat throughout the year.</p> <p>Well-being Level 2 People in this group trade in fish. Their income is not reliable and sustainable because fish business always has ups and downs. Sales are only good in times when fish catching is easy like the hot season. In cold seasons, there isn't a lot of catches and hence they don't have any other source of income. They don't own any important and precious property and livestock to depend on when fish sales go down so their business is not very good. They don't grow any food in their fields and hence do not have reliable food reserves to keep them going when fish business does not do well</p> <p>Well-being Level 3 These people don't do anything to afford proper meals daily. Most of these people are the aged and widowed women. They earn little money selling vegetables in the market and selling beer they brew at their homes. They don't own livestock. They don't grow any crop because they don't have pieces of land where to do the farming.</p>	

INFORMANT 3	
Informant:	LUTANGU SIMASIKU
Sex:	FEMALE

Age:	59
Neighbourhood:	TOMU-MUYAMBANGO
Assistant:	MASIYE NSONGA
Date:	26/05/2015
Level 1 (Richest):	1, 7, 8, 14
Level 2 (Medium):	2, 3, 9, 10, 12, 13
Level 3 (Lowest):	4, 5, 6, 11
COMMENTS	
<p>Well-being Level 1 People in this level have a lot of money. Most of them own property like big buses used as public transport. Others have a lot of cattle while others own workshops and make furniture. They live comfortably and they usually lack nothing. They have enough to eat and children attain basic education because they can afford to sponsor them to school. Intelligent children even go for higher learning at college level because parents can afford to pay. They also cultivate big maize fields because they have the farming implements like ploughs and planters and they can afford to employ cheap labour to weed their fields. They also use their oxen to cultivate their fields so they don't have any problem.</p> <p>Well-being Level 2 Life for these people is not as easy as that of the people in level 1 but they work hard for their survival. These people are own small businesses like selling consumable commodities at small make shift stores, but it is not something to be happy about though it keeps them going. Others grow and sale vegetables. They plant maize for household consumption in small fields because they have small pieces of land and they don't have oxen to cultivate the fields. They cannot afford to pay huge sums of money to hire oxen and ploughs because owners demand high fees to use their animals to cultivate the fields. However, they still manage to have at least 2 meals a day and never sleep hungry.</p> <p>Well-being Level 3 These are the poorest of the community. Living standards are very poor. In this group some people are aged and can be excused from being unable to look for work to work in other people's fields to earn a living though the majority of these people have the capacity to work and manage to eat at least twice a day but are just too lazy to do so. Whenever they are given money by relatives or friends to start small businesses, they misuse the money through beer drinking and buying things to consume at that moment without thought for tomorrow. The next day, they have nothing to eat and nowhere to start from. They don't eat well, don't grow anything in their small fields and are also lazy to do gardening for their households or for sale. They usually never know what or where tomorrow's food would come from</p>	

19.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING IN TOMU-MUYAMBANGO COMMUNITY

HH No.	Household Name	Well-being level assigned according to informant						AVERAGE SCORE
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	
1	Catherine Kasweka	1	33	1	33	1	33	33
2	Renald Kanchele	2	67	2	67	2	67	67
3	Richard Siulapwa	1	33	1	33	2	67	44
4	Chripine Lwando	2	67	2	67	3	100	78
5	Morgan Lindunda	3	100	2	67	3	100	89
6	Monde Simasiku	3	100	2	67	3	100	89
7	Kelvin Simasiku	2	67	1	33	1	33	44
8	Lutangu Simasiku	1	33	2	67	1	33	44
9	Mundia Nawa	2	67	2	67	2	67	67
10	Chiwelele Simonda	2	67	2	67	2	67	67
11	Sinkende Siulapwa	3	100	3	100	3	100	100
12	Margarate Kabisa	3	100	3	100	2	67	89
13	Maurice Mate	3	100	3	100	2	67	89
14	Kalaluka Nawa	2	67	1	33	1	33	44

19.3 RANK ORDER OF THE HOUSEHOLDS IN TOMU-MUYAMBANGO COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	33	1
2	44	3
3	44	7
4	44	8
5	44	14
6	67	2
7	67	9
8	67	10

9	78	4
10	89	5
11	89	6
12	89	12
13	89	13
14	100	11

20. WEALTH RANKING IN NALITUWE COMMUNITY

20.1 RECORDING RESPONSES OF WEALTH RANKINGS IN NALITUWE COMMUNITY

INFORMANT 1	
Informant:	VIOLA MUZUNGU
Sex:	FEMALE
Age:	34
Neighbourhood:	NALITUWE
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest) :	1, 2, 17, 20
Level 2 (Medium):	3, 5, 6, 8, 9, 12, 13, 14, 18, 19
Level 3 (Poorest):	4, 7, 10, 11, 15, 16
COMMENTS	
Well-being Level 1	

People in this group own farm lands of around 6 hectors and are able to produce about 50 bags of maize sold to FRA. They also own about 6 cattle each, most of which is used as drought power. They also help out other extended families to use cattle for drought power. They are able to educate their children from their earnings. Their houses have iron sheets whereas a few have thatched houses. They can afford to eat well all year round.

Well-being Level 2

People in this group produce crops for home consumption only because they do not have farming implements to produce a lot of crops for sale. Some of them have to borrow implements to use for farming which is not a sustainable means of farming. They also do day labour to survive and earn extra incomes.

Well-being Level 3

People in this group do not own any cattle. The majority of people in this group are not married. Some people in this group burn charcoal to earn an income.

INFORMANT 2	
Informant:	MWAKA MUTELELE
Sex:	FEMALE
Age:	26
Neighbourhood:	NALITUWE
Assistant:	MASIYE NSONGA
Date:	21/05/2015
Level 1 (Richest):	1, 11
Level 2 (Upper Middle):	3, 5, 9, 17, 20
Level 3 (Lower Middle)	2, 4, 6, 7, 12, 13
Level 4 (Lowest):	8, 10, 14, 15, 16, 18, 19

COMMENTS

Well-being Level 1

People in this group own cattle of around 70 – 80. They also own pigs around 5 – 10 and goats around 10 – 15. They also have countless number of chickens. Their farms are around 3 – 5 hectares. People in this group have farming implements. Only a few sell charcoal. Their houses are made of brick and iron roofing sheets. People in this group can afford to take their children to school.

Well-being Level 2

People in this group own farms and cattle of around 6 – 10. They however do not own any pigs though some have goats of amounting to 3 or so. Some of the people in this group keep pigeons. Their houses are made of bricks. There are, however, some people within the group that have houses made of mud and poles. People in this group can afford to have three meals in a day and they are able to educate their children with no difficulty. They do day labour to raise income.

Well-being Level 3

People in this group do not own any cattle. They survive on day labour such as working the fields or herding cattle to manage their livelihoods. They also burn and sell charcoal to sustain their livelihoods. They are only able to have two meals in a day.

Well-being Level 4

People in this group have no cattle. They are also unable to do day labour. They highly depend on extended family members to sustain their livelihoods. If they have two meals in a day, then they have a good day. Otherwise, they can only afford to have one meal a day.

INFORMANT 3	
Informant:	MIKE MAINGA
Sex:	MALE
Age:	36
Neighbourhood:	NALITUWE
Assistant:	MASIYE NSONGA
Date:	21/05/2015

Level 1 (Richest):	3, 9, 11
Level 2 (Upper Middle):	1, 2, 4, 5, 10, 13, 17, 19, 20
Level 3 (Lower Middle)	6, 12, 14, 15, 16, 18
Level 4 (Lowest):	7, 8
COMMENTS	
<p>Well-being Level 1 People in this group are well to do. They do not use much effort to plough their fields because they have resources to hire labourers to do that kind of work for them. They have more than one farm, sometimes up to 6. Their farms are around 6 hectares each. They own pigs amounting to 5 – 10 and goats ranging around 8 – 10. They have cattle amounting to 40 – 70. Their houses are made of brick walls. Only a few have houses made of mud and poles though roofed with iron sheets. They have the ability to take their children to decent schools and get a decent education. They can have 3 meals in a day.</p> <p>Well-being Level 2 The majority of people in this group are young couples that are potentially beginning their own livelihoods away from parents. They own cattle of around 3 – 5; goats of around 5 – 8; and pigs or around 6 – 8. Their houses were made of mud and poles and roofed with iron sheets. They survive on working for other people weeding their fields and herding cattle. They are able to afford three meals a day.</p> <p>Well-being Level 3 People in this group depend on people in group 1 and 2 for support. They own farms of their own, but to manage them, they have to first serve in other people’s fields with cattle for four days and would be given a day only for their farms. They own goats and chickens. They do not own any cattle or pigs. They can afford to have meals twice a day. Their houses are made of mud and poles and roofs thatched with grass. Through day labour, they are able to raise money to support their families and children’s basic education.</p> <p>Well-being Level 4 People in this group are elderly people that depend on others for support, specifically their children and people within the village. People in this group do not own any cattle, pigs or chickens. Their houses are made of mud and poles. Their roof of their houses is thatched with grass. Through community projects, they have been able to access 1 or 2 goats each.</p>	

**20.2 HOUSEHOLDS RANKED AND SCORED ACCORDING TO THEIR LEVEL OF WELL-BEING
IN NALITUWE COMMUNITY**

HH No.	Household Name	Well-being level assigned according to informant						
		INF 1 (3)	INF 1 SCORE	INF 2 (3)	INF 2 SCORE	INF 3 (3)	INF 3 SCORE	AVERAGE SCORE
1	Jacob Mushabati	1	33	1	25	2	50	36
2	Oscar Likando	1	33	3	75	2	50	53
3	Mulemwa Patson	2	67	2	50	1	25	47
4	Katazo Lusiyalike	3	100	3	75	2	50	75
5	Abraham Mulemwa	2	67	2	50	2	50	55
6	David Situmbeko	2	67	3	75	3	75	72
7	Vincent Simbotwe	3	100	3	75	4	100	92
8	Situmbeko Walisiku	2	67	4	100	4	100	88
9	Charles Mutelele	2	67	2	50	1	25	47
10	Vincent Simachembele	3	100	4	100	2	50	83
11	Richwell Machona	3	100	1	25	1	25	50
12	Mulauli Malambo	2	67	3	75	3	75	72
13	Mike Mainga	2	67	3	75	2	50	64
14	Mwaka Mutelele	2	67	4	100	3	75	81
15	Mathews Masupa	3	100	4	100	3	75	92
16	Imbula Simachembele	3	100	4	100	3	75	92
17	Bo Simasiku	1	33	2	50	2	50	44
18	Bo Siasimukau	3	100	4	100	3	75	92
19	Royce Mutelele	3	100	4	100	2	50	83
20	George Siandobe	1	33	2	50	2	50	44

20.3 RANK ORDER OF THE HOUSEHOLDS IN NALITUWE COMMUNITY

POSITION	AVERAGE RANK SCORE	HOUSEHOLD NUMBER
1	36	1
2	44	17
3	44	20
4	47	3
5	47	9
6	50	11

7	53	2
8	55	5
9	64	13
10	72	6
11	72	12
12	75	4
13	81	14
14	83	10
15	83	19
16	88	8
17	92	7
18	92	15
19	92	16
20	92	18

APPENDIX 17: DETAILS OF INTERVIEW CODES

Type of Interview	Name	Interview Code
Focus group discussions	Mwandi Community	1:1
	Kawana Community	1:2
	Siankande Community	1:3
	Namapande Community	1:4
	Mulombwe-Kasaya Community	1:5
In-depth interviews in Kazungula District	Mr. Muleya Siachinji	2:1
	Mr. Moono Mutambwa	2:2
	Mr. Rex Mukanta	2:3
	Mr. Grey Kaowo	2:4
	Mr. Gisford Muleya	2:5
	Mr. Happy James	2:6
	Mr. Sekute Sikute	2:7
	Mr. Alfred Mulele	2:8
	Mr. Likando	2:9
	Mr. Kapalu Nyamozhi	2:10
	Mr. Choonze	2:11
	Dr. Jackson Soko	2:12
	Silvasy Shibulo	2:13
	Mr. Kelyson Mangola	2:14
Mr. Trediny Mungabwa	2:15	
In-depth interviews in Sesheke District	Mr. Muyangana Mwandamena	3:1
	Mr. Given Muleya	3:2
	Mr. Shokile Mwalindu	3:3
	Dr. Webster Chikampa	3:4
	Mr. Ackson Chiyombe	3:5
	Mr. Lunguni Kingoe	3:6
	Ms. Sandie Chanda	3:7
	Mr. Kawana	3:8
	Mr. Humphrey Mubita	3:9
	Mr. Kenny Mutambeko	3:10
	Ms. Patricia Kalipa	3:11
	Mr. Chipango Kamboyi	3:12
	Mr. Inambao Nalumino	3:13
	Mr. Moses Katongo	3:14
Mr. Nsangu	3:15	
Mr. Litiya	3:16	
Mr. Kennedy Mundia	3:17	

	Ms. Ngula Mubonda	3:18
	Mr. Chrispine Miyanda	3:19
	Ms. Chikanya	3:20
	Mr. Rodwell Muntanga	3:21
	Ms. Musonda Mwenda	3:22
	Mr. Maambo Pius	3:23
	Mr. Mosho Muhanyi	3:24
Consultative meetings	1 st Kazungula workshop	4:1
	1 st Sesheke workshop	4:2
	2 nd Kazungula workshop	4:3
	2 nd Sesheke workshop	4:4
In-depth interviews in Lusaka and Livingstone	Mr. Munalula Mate	5:1
	Ms. Josephine Mbewe	5:2
	Mr. Donald Lubambe	5:3
	Mr. Westone Siachongwe	5:4
	Mr. Victor Musumali	5:5
	Ms. Bwalya Simwangala	5:6
	Mr. Muntali	5:7
	Mr. Wisford Mudenda	5:8
	Mr. Kangomba	5:9
	Mr. David Kaluba	5:10
	Mr. Iretomiwa Olutunji	5:11
	Mr. Richard Nambwalu	5:12
	Mr. Nkaba	5:13
	Mr. Jones Musonda	5:14
	Ms. Perrin Banks	5:15
Mr. Chilongo	5:16	
Mr. Harrison Nyirenda	5:17	