

UNIVERSITY OF NAIROBI



FACULTY OF ARTS

DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK

TOPIC:

**THE EFFECT OF DROUGHT AND FAMINE ON AGRICULTURAL PRODUCTION,
LIVING STANDARDS AND EDUCATIONAL STATUS OF THE PEOPLE OF KITUI
COUNTY, KENYA**

PRESENTED BY:

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE
REQUIREMENTS OF THE AWARD OF THE DEGREE OF MASTER OF ARTS IN
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DECLARATION

This research report is my original work and has never been presented for a master’s degree or any other award in any other Institution of higher learning.

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This research report has been submitted for examination with my approval as the University supervisor.

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DEDICATION

I wish to dedicate this project to my family for their love and everlasting support. May the Almighty God bless you all tremendously.

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I wish to express my sincere gratitude to the Almighty God for His goodness and mercy in my life and especially during my research project.

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LIST OF ABBREVIATIONS

CBO	Community Based Organization
DRM	Disaster Risk Management
FAO	Food and Agriculture Organization
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IISD	International Institute for Sustainable Development
ISDR	International Study for Disaster Reduction
KNBS	Kenya National Bureaus of Statistics
MDG	Millennium Development Goals
NCLR	National Council for Law Reporting
NGO	Non-Governmental Organization
ROK	Republic of Kenya
SPSS	Statistical Package for the Social Science
UN	United Nations
UNDP	United Nations Development Programme
USAID	United Sates Agency for International Development
WFP	World Food Programme

ABSTRACT

The study examined the effects of drought and famine on agricultural production, living standards and educational status of the people of Kitui County and also the control measures adopted by the community in curbing drought and famine. The study is meant to add knowledge on the understanding of how prepared and resilient rural communities are in response to drought and famine. The study was conducted in Ikutha, Mutomo and Lower Yatta districts of Kitui County. The site was chosen because it is a semi-arid area with a large number of small-scale agro-pastoralists and has been affected by drought and famine for over a period of 30 years. However, many efforts have been made by the government and both local and international NGOs to assist the communities cope with famine and drought.

The design of this research was descriptive research design. The study used simple random sampling to select a sample of 150 respondents, who provided the relevant data for the study as they have experienced drought and famine in the area and have seen the resilience measures adopted to curb the impact of drought and famine. The quantitative data was collected from households and analyzed using a Statistical Package for Social Sciences (SPSS) while qualitative was by use of focus group discussions and key informant interviews and was analyzed using content analysis.

The study concluded that failure to involve all stakeholders in responding to drought has been a major challenge. Community participation, resilience and preparedness in drought has been ignored and emphasis has been on emergency relief and response. The affected communities have also become too weak when drought strikes and unilateral declaration by project administrators without listening to people's responses which would involve communities has also been a challenge. Failure to implement the recommendations made has also been a major challenge. On the success there has been building of boreholes which has increased access to water for the community. Irrigation has also been implemented and conservation of the environment has also been implemented. The study also concluded that various organizations have supported the community in coping with drought through various measures such as conducting forums and sensitizing the locals on the need of conserving the environment through planting of trees and eliminating deforestation which is a major cause of drought. Various organizations have built boreholes for the locals to increase the water content for the community. In coping with drought the residents have been empowered to grow drought resistant crops which can cope under harsh weather conditions.

The study recommends that the community in Kitui County should be encouraged to diversify their income generating activities. The study also recommends that the residents in Kitui County be encouraged to grow drought resistant crops such as sorghum and millet. The community should be educated on the importance of trees to the environment to reduce tree` cutting firewood. The government should encourage parents on the importance of education. Education will provide opportunities in the future for their children. Promote formation of local rural institutions and farmer groups. This will help in educating farmers on fertilizers, seed varieties, crop diversification and also livelihood diversification, development of community drought early warning systems.

CHAPTER ONE: INTRODUCTION

1.0 Background of the Study

A drought is a period of below-average precipitation in a given region, resulting in prolonged shortages in its waters supply, whether atmospheric, surface or ground water. A drought can last for months or years, or may be declared after as few as 15 days. It can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm to the local economy.

The drought and famine of 1984-85 began in Ukambani with the failure of rain and crops in two consecutive seasons in 1983 and 1984, combined with the near total depletion of green fodder sources. The Akamba suffered up to 60% reductions in livestock and liquidated many of their hard-won assets in order to purchase food (Glantz, 1976). The loss of draught animals (oxen) hampered many farmers' recovery from the drought and reduced their ability to cultivate their croplands in subsequent years. Children and the elderly died from starvation in many areas and severe and chronic malnutrition were widespread in Machakos and Kitui. The extent and impact of the drought and the experience of famine varied substantially among regions, communities, households and individuals, with results ranging from death and disability of family members to windfall profits from livestock and food trading (Abdul, 1976).

Ukambani had recourse to off-farm enterprises, savings, and investments, as well as to cash remittances from urban migrants, while the drier, lowland areas were harder hit. Farmers had to typically offset crop losses through livestock sales or remittances and purchased food at "normal" prices from the cities or the highlands. In 1984-85, however, livestock prices were greatly reduced in a nationally glutted market (Makau, 1998). Due to the national scale of the drought, there was for a time virtually no food to be purchased in the dry land communities of Ukambani, except at vastly inflated prices beyond the means of most rural people. Hence, in Machakos, 1984 was known as the famine "Nikw'a Ngwete" ("I Shall Die with money in my hand"). Eventually, at least 300,000 people in Kitui and as many in Machakos received food aid from the Government of Kenya relief program in 1984-85.

There were pronounced differences in the magnitude and character of drought impacts on men and women. As their usual dry season water sources dried up, women and children in the drier zones spent substantially longer hours fetching and carrying water. The feminization of poverty in Ukambani expanded in 1984 to include the feminization of famine and of famine response (Glantz, 1987). Women sought the advice of elder men and experimented widely to identify emergency fodder plants - a knowledge and responsibility previously in men's domain. They fell back on political and social skills to gain access to food, fodder, water, and cash from neighbors, relatives, and absentee husbands and sons. Their returns to labor decreased sharply in the daily search for water, food, and fuel, while their purchasing power with remittance income (when available) also declined due to rising prices of scarce food. As Ukambani began to recover in 1985 rural people variously attributed their successful survival of the famine to indigenous food, fodder, and medicinal plants, cash remittances, migration, group work and group contacts with official and external sources of relief aid, and mobilization of family; clan, church, and other networks of mutual support. Government authorities and development agencies, in contrast, emphasized the success of market-based relief policies in the 1984-85 famine, an approach which they extended when Ukambani faced another famine seven years later (John, 1997).

The drought of 1991-92 was more localized and food was more widely available in the markets, but cash- and asset-starved farmers could purchase it only at inflated prices three to four times the normal cost. Due to the 1984-85 drought, as well as land hunger, most farmers had few animals to sell and many none at all (John, 2007). In addition to wage labor on plantations, many families in the dry lowlands of Machakos and Kitui, from the poorest to the more "successful" farmers, produced and sold charcoal at one-fourth the usual price to earn cash for food purchases. The landless and near-landless, as well as smallholders with no trees, either purchased trees to burn or entered into tree "sharecropping" arrangements. The inflated price of food and depressed price of charcoal resulted in a distorted exchange of trees for food; trees as assets were liquidated at 8-10% of their usual market value as measured in food purchasing power. Unforeseen by the analysts of the 1985 drought response, the market as a mechanism for food relief in Ukambani carries with it a strong incentive to deplete standing trees for charcoal, preempting future use as sources of food, fodder, timber, fuel and watershed protection (William, 2001).

As for drought recovery in 1991-92, several national and international development agencies attempted to apply another lesson of the last famine that the nation's dry lands were over dependent on maize. They distributed sorghum and millet seed, much to the consternation of Akamba farmers otherwise lacking any seed to plant at the onset of the next rains (Dummett, 2004). When the millet matured there was a milk shortage, since the traditional millet porridge requires milk - already a scarce commodity due to large-scale livestock reductions in the 1984-85 famine. With no milk to prepare the millet, poor farmers sought to trade or sell millet to procure maize. The price of milk soared, the price of millet plummeted, and once again, decreased returns to land and labor, in real terms, left poor farmers (mostly women) paying for the mistakes of crisis response policy (Kinealy, 1995).

During the early colonial period, human and cattle disease was the dominant crisis identified by administrators and travelers in Ukambani. The 1890s saw the construction of the Uganda Railroad, which likely contributed to the spread of rinderpest among cattle as well as the introduction of smallpox by foreigners. These forces combined with a drought in the late 1890s to bring about the great famine of 1897-1901. Since cattle served as the main drought insurance, the results of combined drought and cattle disease were devastating, particularly in Kitui, where official figures suggest that upward of 50% of the people perished. Viewing the devastation around them, colonial officials and observers, while recognizing the epidemics, blamed Akamba cattle-rearing practices as well as their "primitive" standard of living for the magnitude of the disaster. Writing around the turn of the century, colonial observers identified several reasons for the Akamba's supposedly low standard of living, accusing them of weakness of character, irrational attachment to their cattle, and inefficient and destructive cultivation practices. Noting the famine "resulting" from these social and agricultural practices, colonial authorities defined a "public health crisis" among the Akamba. This "public health crisis" paralleled a concurrent crisis construction by Progressive-era reformers in the United States and Great Britain who were associating high population densities in urban slums with poor household maintenance practices, poor hygiene, and the spread of disease. Colonial and urban reform movements identified similar problems and solutions, each relying optimistically on state regulation of household behavior to cope with the problems which ensued with the advent of modernity.

In both Ukambani and working-class England, women's household practices were judged against the standard of the Victorian women and were frequently found wanting. As working-class English women received training in mothering skills and home economics. Colonial observers criticized the Akamba for their alleged "sexual immorality" and noted critically that "the women do all the work in the fields and are also hewers of wood and drawers of water". While the naming of the epidemics which plagued Ukambani during the 1890s reflected European experiences and prejudices, the epidemics themselves derived from contact with European people and livestock, whose very presence was a response to events unfolding in Europe (Miller, 1982). The British were primarily responding to conflicts on the global stage, as inter-European political and economic competition intensified, culminating in the 1884 Congress of Berlin and the "scramble for Africa." The Uganda Railroad was built in part to solidify British control of East Africa and the authorities encouraged European settlers in an effort to make the railroad pay for itself (Blake et al., 1967). The settlers, in turn, faced a land shortage, as the Akamba tenure system depended on expanses of open, communally held pastureland. The settlers responded with an extensive land seizure and enclosure program.

By 1920, the Akamba had lost effective access to about two-thirds of the land they had formerly controlled, including their most fertile lands and half of all their pasture. Along with some of their best grazing land, they lost the freedom to migrate seasonally and periodically in search of water, pasture, and cropland. For the Akamba, the crisis of the era was one of land alienation, as settlers disrupted their tenure system and took away their land. At the same time, the state barred the Akamba from the export-oriented agricultural sector in an effort to protect the white settlers' monopoly (Brennan, 1984). These policies contributed to a continuing crisis of cattle disease; agro-pastoralists were left with few options other than to preserve underfed and sickly cattle, their major assets, in overcrowded reserves where disease spread easily. These colonial land tenure policies also forced the Akamba into sedentary settlements and continuous cultivation on relatively small areas of poor quality land. This process of concentration, in turn, sowed the seeds of future crises, including those of land degradation, "overpopulation," and urban migration (Kinealy, 1995).

1.1 Problem Statement

Drought and famine have been the talk in the last decade in Kitui County where the residents have suffered a lot from the disaster. The rainfall trends in the area have been very unpredictable exposing the area to persistent droughts leading to famine. According to the UN reports greater populations rely on relief foods from the NGOs and the central government as the area is not able to sustain its population in terms of food production. Various studies done and implemented on other areas with the same geographical position have shown that drought and famine can be controlled by creating awareness then coming up with counteractive measures of helping the population from famine which is the later disaster.

Droughts have become more frequent and severe over the recent years. Owing to the drought effects, loss of livelihood and assets during successive droughts, has been experienced in many parts of Kenya rendering her food security status, fragile. (USAID 2012). Disaster risk management at the local level was a key element in any viable national strategy to reduce disaster risks, building on the quality of community networks, the social fabric, and effective governance. (UNDP, 2005) Community participation in drought disaster risk management had been ignored and emphasis has been on emergency relief and response. The affected communities become too weak when drought strikes and unilateral declaration by project administrators without listening to people's responses would involve communities by; answering questions posed by extractive drought risk assessors and using questionnaire surveys without giving the opportunity to prioritize felt needs (Wilford, 1993).

Various actors have implemented work based food assistance programmes as a way of involving the public in resilience building. Several drought disaster risk management programmes have been designed by the government and development partners to save livelihoods and help communities become more resilient by creation of productive communal and household assets. These efforts have not yielded sustainable resilience in Kitui County. Participation roles assumed by the community in interventions should support the investment by the agencies and create synergy among disaster risk management actors geared towards spurring positive impact of designed interventions in order to navigate communities from drought risk (Wilford, 1993). Drought risk management was more effective when the communities themselves (IFRC 2011)

undertook majority of the activities contributing to a safe and resilient community. Accordingly, this study sought to determine and describe the role of community participation in the implementation and management of drought reduction interventions in Kitui County, Kenya.

Drought and famine have affected various aspects in the county as education levels are very low with schools attracting low enrollments while majority of the youth migrate to urban areas to look for jobs to sustain their siblings and their families. This calamity has also led to poor agricultural production and forces the population to rely on relief foods which are not enough and cannot be provided all through the year. Low food production results to poorly fed population meaning that majority are malnourished and generally subjected to poor health. Living standards also are an aspect to be looked at, as it's also affected by the disaster. A very big population lives poorly and in sketchy structures since their incomes cannot allow them to develop in terms of housing. This is because the little that is earned is for food, and is normally not enough.

With all these problems in place, NGOs have established their camps in the area to help the people in curbing the problems associated with the disaster. They majorly focus on irrigation projects to supplement the little food they raise in the farms; this has gone to the extent of establishing greenhouses in the area so as to boost food production. Water projects also have been established and making sure that the population can reach water from the nearby sources without much straining and at a reduced distance. This is not only done by NGOs but the government has also chipped in and funded the construction of dams across seasonal rivers and streams so as to harvest water in a reservoir. The government introduced feeding programmes in schools, so as to reduce the effects of hunger in schools and also to attract reasonable enrollment. With these problems and some solutions offered the study sought to find more solutions with regards to disaster preparedness and resilience in rural communities and in this case, a study of Kitui County. The research focused on how famine and drought affected various aspects of the community, like agricultural production, educational status and their living standards.

1.2 Research Questions

- i. How has drought and famine affected agricultural production in the county?
- ii. To what extent does drought and famine influence the living standards of the people in the county?
- iii. Is there any significant relationship between drought and famine and education status in the county?
- iv. Do the control measures adopted by the people of Kitui County help in curbing the problem of persistent drought and famine?
- v. What is the role of the government and NGOs in counteracting drought and famine in the county?

1.3 Objective of the study

1.3.1 Main objective

The main objective of the study was to investigate disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and educational status of the people of Kitui County.

1.3.2 Specific Objectives

The specific objectives of the study are:

- i. To establish the effects drought and famine has on the living standards and household welfare of the people of Kitui County.
- ii. To identify the control measures put in place to curb drought and famine in Kitui County
- iii. To show how efforts to combat drought and famine have affected agricultural production in Kitui County.
- iv. To investigate the role played by the government, local and international NGOs and community based organizations in counteracting drought and famine in the county.

1.4 Justification of the Study

The study helped in identifying the effects of drought and famine on aspects like; living standards, educational level and agricultural production of the people of Kitui County. The study also focused on the role played by NGOs and the government in counteracting the effects of drought and famine in Kitui County. Kitui County was chosen because it is a semi-arid area and the community has experienced many years of persistent drought and famine. On the other hand, the topic was chosen because drought is one of the leading disasters in the country. The study generated suggestions, which were significant to formulation of policy statements through its recommendations. The study made recommendations on the diversification of income generating activities, planting of drought resistant crops and adaptation efforts in farming practices. Such recommendations could inform policy formulation in the county and other counties in the country because they originated from valid research data.

1.5 Scope and Limitations of the Study

1.5.1 Scope of the Study

The scope of the study was disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and educational status of the people of Kitui. The study was conducted in Ikutha, Mutomo and Lower Yatta districts of Kitui County. Kitui County is among the most drought-vulnerable regions in Kenya. The manifestation of climate change has resulted into unpredictable and depressed crop yields and loss of livestock, leading to perennial food shortages and over-reliance on emergency food-based interventions to meet the local food deficit (ROK, 2005). Therefore, there was need to assess how the community in Kitui have adapted to changes in climate change. This was done by investigating the effects of drought and famine on the living standards, educational status and agricultural production of the people of Kitui

1.5.2 Limitations of the Study

The area under study was not easily accessible due to the poor infrastructure; Time factor was also a limitation factor as the researcher was based in the urban area and the study was conducted in the rural area which meant a lot of time was spared for the study; Financial resources also

posed a challenge to the researcher in carrying out the study; Language barrier and illiteracy of the respondents was also as a big challenge to the researcher and therefore, an interpreter had to be sought and finally long bureaucratic procedures from government officers and NGOs, who were the key informants, caused delays in approval of authority to collect data.

1.6 Operational Definition of terms

Drought

A drought is a period of below-average precipitation in a given region, resulting in prolonged shortages in its waters supply, whether atmospheric, surface or ground water. A drought can last for months or years, or may be declared after as few as 15 days.

Famine

A famine is a widespread scarcity of food,[1] caused by several factors including crop failure, population unbalance, or government policies. This phenomenon is usually accompanied or followed by regional malnutrition, starvation, epidemic, and increased mortality.

Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) 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”.

Disaster

A disaster is a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community and society to cope using its own resources.

Disaster Preparedness

The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

Disaster Resilience

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Disaster Risk Management

The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster

Hazard

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

This chapter looks at the overview of drought risk reduction and published literature on the role of community participation. It further considers what has been learnt on community participation in various settings for comparison purposes so as to elicit how community participation could be enhanced in effective disaster preparedness and resilience efforts and ultimately disaster risk management.

2.1 Literature Review

2.1.1 Overview of Community Participation

Drought is a weather-related natural hazard which may affect vast regions for months or years with protracted impacts on food production reducing life expectancy and the economic performance of large regions or entire countries (ISDR, 2009). Keddy (2007) elaborates drought as a recurrent feature of the climate occurring virtually in all climatic zones whose characteristics vary significantly among regions differing from aridity in that it is temporary whereas aridity is a permanent characteristic of regions with low rainfall. Drought is more than a physical phenomenon or natural event whose impact results from the relation between a natural event and demands on water supply and often exacerbated by human activities. Significant environmental, agricultural, health, economic and social consequences signifies drought periods.

According to George, et al (2003), drought is among the world's earliest documented climatic events, present in the Epic of Gilgamesh and tied to the biblical story of Joseph's arrival in and the later exodus from Ancient Egypt. The Akkadian empire, under the rule of Sargon, collapsed abruptly in the beginning of 2200 B.C. after only a century of prosperity following a 300-year drought as depicted by microscopic analysis of soil moisture at the ruins of Akkadian cities in the northern farmlands, which disclosed that the onset of the drought was swift, and the consequences severe. In 2005, parts of the Amazon basin experienced the worst drought in 100 years (World Bank, 2010). According to Mayell (2002), the earliest exodus of humans out of Africa and into the rest of the world were the hunters and gatherers migration, linked to drought phenomenon, dating back to 9,500 BC. Immense droughts overwhelmed community coping and survivability capabilities owing to low level of preparedness and participation in drought risk

reduction. ISDR (2005) records that Sahel region suffered from a series of historic droughts, beginning the 17th century to the end of the 19th century where droughts caused dramatic environmental and societal effects upon the Sahel nations. The area was struck by severe famine from the late 1960s to early 1980s that claimed thousands lives, left many people dependent on food aid and severely destroyed livelihoods impacting economies, agriculture, livestock and human populations of much of Upper Volta countries. Ahmeda (2013) observed that people living in the drainage basin of the Himalayan Rivers would be at risk of floods followed by droughts in coming decades affecting the Ganges while the west coast of North America, which gets much of its water from glaciers in mountain ranges were also be affected. Kenya (2009) indicates that there has been an increase in the intensity and frequency of occurrence of drought disasters over the past two decades. UNDP (2011) illustrates that in the ASALs of Sub-Saharan Africa, it is likely that the forces of extreme weather events and aridity became more frequent and intense as a result of climate change thereby undermining and offsetting much of the progress already achieved in meeting the United Nations Millennium Development Goals and contribute to the continued downward spiral of poverty and environmental degradation

Oxfam (2011) elaborates that climate in the Horn is experiencing an increase in the rates of drought and that drought-related shocks used to occur every ten years, and they are now occurring every five years or less. Among Borana communities of Ethiopia, whereas droughts were recorded every 6-8 years in the past, they now occur every 1-2 years which is now the case over the entire East Africa region (Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania and Uganda) and come with inevitable uncertainties associated with localized impacts. They nonetheless show that even with moderate increases in the length of crop growing period in some patches of the region, agricultural productivity could decline dramatically due to climate change in the decades ahead as temperatures increase and rain patterns change. On top of these projections, any incidence of extreme weather events like droughts would further be hit food production in the region. These reductions in food production would have severe consequences most directly for smallholder farmers and agro-pastoralists, who rely on farming for income, and for all those who purchase such crops. Kenya (2009) describes Kenya's disaster profile as being dominated by drought disasters that disrupt people's livelihoods, destroy infrastructure, divert planned use of resources, interrupt economic activities and

retard development. Kenya (2009) records that 1999-2001 drought disaster response costs were more than would otherwise be the case if sufficient efforts had been put in place for effective disaster management.

Drought disaster risk management involves systematic analysis and manage of the effects of droughts through reduced exposure, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (ISDR, 2005). Community participation refers to members of the public taking part in the analysis and management of threats posed by drought and developing survivability capacities. Goyet, (1999) challenges the myth that drought affected population would be too shocked and helpless to take responsibility for their own survival as superseded by the reality that many find new strength during emergencies. Keen (1994) explains that communities affected by drought disasters have a role to play in disaster risk management and should be given the maximum opportunity to participate in risk reduction and response programmes. People are involved to solve their own problems and cannot be forced to participate in projects which affect their lives but should be given the opportunity for involvement as it is a basic human right and a fundamental principle of democracy (Mainlay & Tan, 2012). Citizens are involved in community needs assessment where the community expresses opinions about desirable improvements, prioritizing goals and negotiating with agencies for synergy building where they are engaged to plan and design interventions through formulation of appropriate objectives, setting goals, criticizing plans based on traditional knowledge of disaster risk management.

Government mobilization of community participation into drought management dates back to the times of Epic of Gilgamesh and biblical times of Joseph. The Bible presents a scenario where the government authoritatively commanded community participation in drought management and drought risk reduction in Egypt where it worked efficiently (ABS, 2004). Effective drought risk reduction involves the participation of communities for maximizing the opportunities, knowledge, and synergies in interventions considering appropriateness of needs, perceptions, and existing capacities. Community knowledge on drought disaster patterns forms a rudimental part of early warning system where forecasting of drought disaster through traditional and scientific methods is

very vital. India, (2009) observed that most drought risk reduction have yielded mixed results due to their failure to recognize the role of community participation in planning and management of interventions and relating them to the traditionally practiced adaptation and coping strategies.

2.1.2 Community Participation and Beneficiary Identification

According to Bryson (2004), beneficiaries in drought risk reduction refers to persons, groups, or organizations that whom leaders, managers and front-line staff must consider in the process of implementing a drought disaster risk management venture. Ironically, while the term has passed the tipping point into common use and the notion that communities must be attended to as key stakeholders is an idea in good currency there is relatively little in the public and non-profit literatures on exactly the role of community in systematically identifying and analyzing beneficiaries (Gladwell, 2000; Schon, 1971).

People participate by forming groups to meet predetermined objectives related to the project, which can involve the development or promotion of externally initiated social organization, which tend to take place after major decisions are made instead of taking place at early stages of project cycles or planning. Many institutions and even the government tend to be dependent on external initiators and facilitators in beneficiary mobilization. Shileche (2012) observes that the role of community participation in identification of beneficiaries of the oil spill related disasters in Kenya was scanty. Shileche further elaborates that an effective disaster risk management should involve effective community participation in identifying the beneficiaries' interests, involvement, expectations, importance, influence and impact on desired disaster risk management project execution as well as any specific communications requirements and come up with a stakeholder register.

Disasters strike the communities in their local setting where they command a big share of the wellbeing of the community (World Bank, FAO & IFAD, 2009). In this case, the community is the primary beneficiaries who are also the key actors as planners, implementers, partners and leaders of disaster risk management. Disaster risk management should be built upon the interest of the most vulnerable members of the community, including women, children, the youth, the elderly, disabled and the sick while addressing the concerns of other stakeholders. Most

vulnerable people have a chance to participate in disaster management activities at local level and may require to be supported in activities to both reduce vulnerability and promote own responsive capacity to disasters. The disaster risk management process must be gender-sensitive and ensure the full participation of women during the whole disaster management process.

However, there are different perceptions of risk amongst the community members and all people see the danger of risk in their own community thus this diversity should be considered in the process of disaster risk management through community participation in planning interventions. Different individuals, families and groups in the community have different vulnerabilities and capacities varying by age, gender, class, occupation, sources of livelihoods, ethnicity, language, religion and physical location.

A successful community managed disaster risk management should bring together local communities in a given geographical setting in the identification of their most at risk beneficiaries and risk reduction strategies to address the priority groups vulnerability. The practice had failed to recognize that the most effective support system during disasters in the community itself since it bears the burden on the survivors and casualties. While external organizations and individuals outside the community play a key role in supporting and guiding local people in disaster management activities more often than not assumes the role of communities in beneficiary identification. Disasters are viewed as unmanaged development risks and unresolved problems of the development process, community disaster risk management should lead to a general improvement of the quality of life of the vast majority of the poor people and of the natural environment (World Bank, 2010).

2.1.3 Community Participation and Needs Identification

According to IISD (2007), disasters, large and small, strike people where they live. It is at the community level that disasters are felt most and frequently, it is also where hazard force is felt and risk reduction steps make the biggest difference. As observed by UNDP (2005), disaster risk management at the local level is a key element in any viable national strategy to reduce disaster risks, building on the quality of community networks, the social fabric and

effective governance. IFRC (2011) elaborates that needs identification and goal determination that contribute to a safe and resilient community should be undertaken by the communities themselves. In the Hyogo Framework for Action, states acknowledged, as a general consideration, that both communities and local authorities should be empowered to manage and reduce disaster risk by having access to the necessary information, resources and authority to implement actions for disaster risk management (ISDR, 2005). The 1992 Rio Declaration on Environment and Development affirmed that disaster issues could best be handled with the participation of all concerned citizens. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazards in their communities, and the opportunity to participate in decision-making processes.

Williams(2006) describes community participation in Post-apartheid South Africa to have literally become synonymous with legitimate governance where executive mayors annually reported on the involvement of community organizations in the affairs of the municipality and ensure that due regard was given to public views and report on the effect of consultation on the decisions of council. Most community participation in post-apartheid South Africa was yet largely spectator politics. Ordinary people mostly become endorsees of pre-designed planning programmes and often the objects of administrative manipulation and a miracle of reconciliation in the international arena of consensus politics whilst state functionaries of both the pre-and post-apartheid eras ensconce themselves as bureaucratic experts summoned to ensure a better life for all.

Consequently, the process, visions and missions of a more equitable society operated merely as promissory notes issued every four years during election campaigns. In the course of this endless rhetoric and multiple platitudes, the very concept of community participation has been largely reduced to a cumbersome ritual; a necessary appendix required by the various laws and policies operating at the local government level. Informed discussions and rational debates on the merits and demerits of specific planning programmes are literally nonexistent, even though community participation features as a key component of planning programmes at the local level. Onsomu et al. (2004) observed that community participation in community schools in Kenya in spite of their high level of poverty and illiteracy, communities had

organized parents associations that had some responsibility in school management. Communities strongly believed in themselves in solving their problems and expected education of their children to insure the way to get out of the vicious circle of poverty and improved resilience.

Community participation is expected to yield more satisfaction to the community from open community involvement and also achieve more results, more rapidly and with greater benefit to the community as a whole (IFAD, 2007). Communities with higher rates of citizen participation in identifying their needs are much more likely to have citizen control of their community governing institutions, more diverse membership, greater adoption of the empowerment approach, and as a result higher levels of success in attracting the resources needed to implement plans to meet their needs. Scott (1998) pointed out that community power involves deep acceptance of one another, complete inclusiveness, and the self-awareness to have a realistic understanding of the circumstances in which the community finds itself. The community offers each member the safety of knowing that they are accepted for whom they are, and bring forth the best each person can to offer, because they know their gifts of time, talent and ideas are acceptable which motivates community members to offer what they have to enable the whole community to prosper (World Bank, 2010). All members of the area should be invited into an open, welcoming community of action, establishing a safe environment in which all can not only benefit, individually and collectively, but also give. Past discrimination, or just the belief that drought disaster risk management needs identification is expert's job, is likely to make citizens reluctant to engage. This is especially true for members of minority groups and for groups that have newly arrived.

Disaster risk management revolves around reducing vulnerable conditions and the root causes of vulnerability while building community readiness and individual survivability capacities. The primary strategy is to increase community's capacities, resources and coping strategies in order to avoid the occurrence of disasters in future. Population numbers and density, economic conditions, religious traditions, literacy, health status, nutritional benefits, political economy, land arrangements, government structures and effectiveness, levels of infrastructural development, educated unemployed youth, exposure levels and other factors are relevant variables in needs identification that are well understood by the

community (Lovell,1992). Lovell also notes that development strategies appropriate in one country are not necessarily needed or appropriate in another because contextual constraints and possibilities differ widely; particular programs are not necessarily replicable country to country even where needs are similar. Barret & Clay (2003) recommended that communities should be involved in the earliest stages of programme inception to ensure the programme meets their needs and captures their support.

In an endeavor to increase women participation in governance, the constitution of Kenya has entrenched the gender policy, which mainstreams the needs of women in planning and encourages women empowerment in decision making process (NCLR, 2010). Many stakeholders are privy of the two-thirds gender rule and have tried to embrace it in disaster risk management and development which aims to improve women voices in decision making process. In Kenya, females constitute a majority of the population (KNBS, 2009). In Kitui County, Women form majority of the workforce for both productive and reproductive work (Kenya, 2007). The community understands the unique needs of the youth with respect to the physical, psychological, cultural, social, biological and political aspects that confront the youth and this knowledge should be considered in drought disaster risk management interventions. The Kenyan youth constitute 75 percent of the country's population, forming the largest source of human resource but have remained on the periphery of the country's affairs and their status has not been accorded due recognition (Kenya, 2007). As a result, many of the youth who are productive and energetic remain unemployed, continue to suffer from poor health, lack sufficient support and apparently play no role in drought disaster risk management. A common misconception of most youth policies has been that boys and girls are a homogeneous group. It is important to critically assess the needs of female and male youth differently as they have different and conflicting interests. Rural adolescent girls are virtually trapped within the domestic sphere performing reproductive chores whereas boys spend more time in productive activities that generate income to the household or for themselves (Bennell, 2007). Involvement of the youth in needs identification is very vital since youth are driven by results of their work and may be discouraged by routine activities which take long to give results (WFP, 2011).

2.1.4 Community Participation and Information Dissemination

An effective drought disaster risk management network is characterized by the establishment of a disaster information management system that clearly outlines the perceived benefits of the community according to their priorities with outreach programs to develop and implement mechanisms that increase community awareness and improve management of hazard risks and vulnerabilities (World Bank, 2010). The system should strive to increase awareness and understanding at the community levels of the sector impact of natural hazards demonstrating strong training programs for community leaders, possessing communication and coordination mechanisms to facilitate preparedness and response capabilities of the communities. The disaster risk management system should set out a clear framework that assists the community in monitoring, forecasting and early warning and assist in warning dissemination incorporating forecasting through mass information dissemination system for community disaster preparedness. The information system should be sensitive to the needs of different groups in the community thereby enabling vulnerable communities and local groups to understand climate forecasts and undertake corresponding disaster preparedness and mitigation activities. Incorporate innovative approaches and technologies for reducing risk to vulnerable communities, incorporating local context with guidelines on financing sources and possible risks.

Today (2009) argues that while drought is one of the hurdles that may prevent Kenya from achieving the millennium development goals (MDGs), especially those related to poverty eradication, attainment of food security and promotion of environmental sustainability involvement and participation of communities would check the situation a great deal. The last decade alone recorded four major food crises in Kenya triggered by drought. When the community lack the opportunity to discuss progress, gaps, relevance of disaster risk management and contribute ideas on best practices for beneficiary identification it leads to poor targeting and embezzlement of resources. Article 1 of the constitution of Kenya vests all sovereign power to the People of Kenya and directs that the power shall be exercised only in accordance with the Constitution. First, the constitution gives the power of self-governance to the people and enhances the participation of the people in the

exercise of the powers of the State and in making decisions affecting them. Secondly, recognizes the right of communities to manage their own affairs and to further their development. Thirdly, protects and promotes the interests and rights of minorities and marginalized communities. Fourthly, promotes social and economic development and the provision of proximate, easily accessible services throughout Kenya; and lastly ensures equitable sharing of national and local resources throughout Kenya. This by default requires timely feedback to the beneficiaries for these powers to be recognized. Timely feedback is vital in management of drought disaster risk management as to provide the community with the opportunity to learn and get involved in the process of recovery and improve on the level of acceptance and survivability. According to Finsterbusch & Van Wicklin (1987), communities should be empowered so as to place final decision-making power in the hands of the public and the agencies should be ready to implement what the community decides and set up community project management committees. Higher levels of community participation allow for increased potential for conflict resolution and arbitration; increased capacity for critical thinking and innovation; and increased capacity for problem-solving. Accountability is a relationship based on obligations to demonstrate, review, and take responsibility for performance, both the results achieved in light of agreed expectations and the means used from an internalized sense of integrity (Finsterbusch & Van Wicklin, 1987). Demonstrating performance involves proactively reporting results achieved and the appropriateness of the means used, which requires honesty, openness, and transparency.

2.1.5 Community Participation, Ownership and Community Control

Community participation in drought risk reduction can represent assigning certain decisive roles to the individuals who are beneficiaries of drought risk reduction. Community participation implies involvement of people, with similar needs and goals, in making decisions that affect their lives. The local community plays an active role in the ownership and control of drought disaster risk management programs and improvements directly affecting their lives. It is rational to give control of affairs and decisions to people most affected by them.

Besides, since no government or authority has the means to solve all the public problems adequately, it is necessary for the communities to own the process and activities of disaster risk management and have control over the matters that affect them (Abrams, 1971).

Community participation not only brings many lasting benefits to people but also a means of getting things done. Citizen participation can be associated with citizen power and control as, the redistribution of power that enables the have-not citizens to be deliberately involved in the planning and implementation of disaster risk management activities. Participation is good and brings people together in creating and making decisions about their environment. Since people are actively involved in the process, participation helps promote sense of ownership and control among the people. In 2004 the world identified and recognized Wangari Muta Maathai for Nobel Prize award, the founder of a community movement that enlisted community participation and control in environmental conservation popularly known as The Greenbelt Movement in Kenya. Although it was the first award to an environmentalist to be awarded the movement did not last long (IISD, 2007). IISD also elaborates an exercise of community control where the public in 1988 apprehended a Brazilian rubber tapper in vehement fight against destruction of Amazon rainforest and made recommendations to the government for assassination of the culprit and a plea that was heeded.

2.2 Theoretical Framework

This part discusses various theories which are related to drought and famine and the adopted resilience measures put in place to counteract their impacts.

2.2.1 Social Theory of Disaster

The issue of disaster in the arena of social sciences gained attention at mid-20th century during which the US government showed interest in understanding the behaviour of the population in case of war (Quarantelli, 1988, quoted in Cardona, 2004). Then a “social theory of disasters” came to life, and this approach involves a series of studies about reactions, and been on responses/reactions of the people in case of emergency, and not strictly on the study of risk. However, this “paradigm of war pattern approach” has been challenged by writers like Quarantelli (Gilbert, 1995) who argued against “the unnecessary linkage between destructive factor and the community as it emerged from the notion of panic”. In relation to this Quarantelli

pointed out that “there was no mechanical relation between these two factors, and thus there was greater autonomy in reactions of people to panic”. Thus Quarantelli’s work contributed to the emergence of new modes of approaching disaster, and thus the relevance of social factors within communities for understanding disasters has been recognized. By the 1970s social science researchers in USA had made shift in conceptualizing disaster, and they have recognized that “disaster has to be studied within the human group involved in it, and not as the result of an exclusive external factor” (Gilbert, 1995). This critical analysis, in fact, rigorously pursued and enhanced by European scientists. This has led to emergence of new approach to disaster which Gilbert calls it “disaster as social vulnerability”. Contributions from geography and “ecologist school” from the 1930s had also led to the conception of social-environmental perspective that subsequently inspired the approach of applied sciences. Its emphasis on the notion that “disaster is not synonymous of natural events and the need to consider the capacity for adaptation or adjustment of a community when faced with natural or technological events was the springboard for vulnerability concept” (Cardona, 2004).

Since 1980s and especially in the 1990s, in Europe and in certain developing countries (Latin America and Asia), social science researchers have critically discussed natural and applied science approaches, and “their approach suggests that vulnerability has a social character and is not limited to potential physical damages or to demographic determinants” (Cardona, 2004).

Initially disaster or hazard studies were dominated by disaster-centered interest and by searching for technological responses. In the 1950s and before this period, disaster studies were dominated by two paradigms - the behavioral and structural paradigms. The former combined hazard-centered interest with the idea that people had to be taught to anticipate it.

Therefore, this approach emphasized monitoring and predicting hazards; explaining people’s behaviour in response to risks and disasters; and developing early warning systems and disaster preparedness schemes. In general, this approach is technocratic and hazard-centered approach to disasters (Hilhorst, 2004). Some authors remarked that this perspective, referred as “dominant approach”, is based on Western science which considered nature and society as separate. The premise was that natural hazards can be controlled, and disasters be avoided through technology

and modern administration. This suggested that less-developed countries suffered disasters than developed ones, since they lacked that necessary technologies and the required modern administration.

War has long been the subject of exploration by social scientists. However, in the 1970s and especially in the 1980s; social scientists began to question the explanatory power of such “dominant approach”. During these periods the relationship between human actions and the effects of disaster (socio-economic dimensions of vulnerability) was increasingly documented and argued by many writers. For instance Hiwett (1998) came up with a landmark work called “Interpretations of calamity from the view points of human ecology”, and argued that “disasters were not primarily the outcome of geographical processes. Especially in developing countries, structural factors such as increasing poverty and related social processes accounted for peoples’ and societies’ vulnerability to disaster”

This has been a new development over the “dominant paradigm” and brings better conceptualization of disaster through connecting hazards and vulnerability where their interaction leads to disaster. This relation is portrayed by the formula of risk = hazard X vulnerability (Blaikie et al., 2004). The scrutinies of the approaches and further empirical work have inspired the development of subsequent perspectives which give attention to environmental processes and impacts of anthropogenic activities. Therefore, an alternative view, described as “social vulnerability approach” has got space in different disciplines and policy communities.

2.2.2 Famine theories

Famine, the most damaging of all disaster types, has a long record in human history. It can be stated that no aspects of social, economic and political lives are untouched, when a famine occurs (Blaikie et al., 2004). Apart from death tolls, it brings livelihood insecurity, impoverishment of natural-resource base, destitution, displacement, trauma, social disorganization, political instability, which may endure for post-famine periods (Davies, 1996; Blaikie et al., 2004). The nature, degree or severity and causes of specific famine disasters vary over time and from one context to another. Whereas there is general understanding on types of

its direct impacts and consequences, there have been various debates about its causes. Accordingly various perspectives have been developed in searching of explanatory factors.

The current literatures show that famines persist, and affect severely some regions of the world, particularly the African countries. Location of famines has shifted, and in fact the supposed causes have changed overtime, and famines have become more complex (Devereux, 2000; Devereux et al., 2002; Blaikie et al., 2004). Traditionally famines have been attributed to drought, and sometimes to flood or epidemics. But as it is stated earlier attributing famines to natural factors has been challenged since the 1980s claiming that drought and sudden-onset ‘natural causes’ are less capable of acting as causes of famines. This notion has stimulated more academic debates on famine causation and led to development of various disciplinary perspectives to explain famine causes. There are four main famine theories which have been developed in the past four decades and are discussed below.

1. Neo-Malthusian

This theory gets its root in Malthus’s thesis (i.e. ‘Essay on Principle of Population, 1798). Malthus’s principle of population was based on the idea that population, if unchecked, increases at geometric rate whereas food supply grows at arithmetical rate. Malthus’s thesis suggests that population grows at exponential rate, while food production increases at arithmetic rate which would lead to food shortage, and ultimately resulting in hunger. In its simplest form, the thesis demonstrated that population could not continue growing indefinitely in a world of fixed natural resources (Devereux, 2002:17). Malthus assumed famine as “natural check” on population growth. According to Malthus famine would act as natural check on population growth, equilibrating the demand for food with supplies.

In general terms, Malthus’s thesis had been criticized and rejected on many grounds. First, viewing famine as ‘natural check’ on population growth control is abhorrent. Secondly Malthus failed to “foresee the ‘fertility transition’ to small families as living standard rose” and the “exponential increases in agricultural productivity” owing to technological advances which “pushes production beyond the consumption needs of the global population” (Devereux, 2002).

And yet Malthus's line of argument is still pursued by neo-Malthusians. These days, a relatively rapid population growth as principal cause of famine lingers among the neo-Malthusians (Fassil, 2005). The neo-Malthusian approach is "focused on potential famine inducing consequences of rapid population growth outstripping the limits of global and regional food production" (Blaikie et al., 2004). This approach emphasizes the supply side and rapid population growth which exceeds the means of subsistence. In other words population growth exceeds the capacity of natural resources which provide means of subsistence (i.e. carrying capacity). Thus in the light of 'carrying capacity' debate, demographers and environmentalists blame the persistence of famine on 'overgrazing' in Africa and on 'overpopulation' in Asia (Devereux, 2002).

However, neo-Malthusian approach is also criticized heavily. Like Malthus's crude argument, neo-Malthusians failed to take into account the role of technology in increasing food production. Moreover, 'mass mortality famines' ('natural check') does not act as population control. Rather fast population growth has been witnessed in countries which were afflicted by various famine episodes in the past (Devereux, 2002:18). There is also evidence that "excessively low population densities increase vulnerability to famine by inhibiting investment in basic economic infrastructure and agricultural technologies" (Boserup, 1983, quoted in Devereux, 2002).

Though Malthusians perspective is implicitly indicated in some contemporary analysis of famine, its theoretical foundation has been challenged. Firstly, technological progress has allowed enormous increase in food production outstripping population growth. Secondly, famine has not acted as the ultimate and powerful check of population growth (Fassil, 2005). Therefore, neo-Malthusians perspective has remained inadequate to explain famine causation.

2. The Environmental 'Supply-side' Explanations

This approach considers drought (sometimes floods) and recently climate change factors in the explanation of disruption or reduction of food output. This approach focuses on environmental limitations on food output, mainly through drought. It looks primarily at supposed 'natural causes' which reduce the capacity of the natural resources to provide adequate food supply (Blaikie et al., 2004). This approach, however, is criticized on the basis that natural events (like

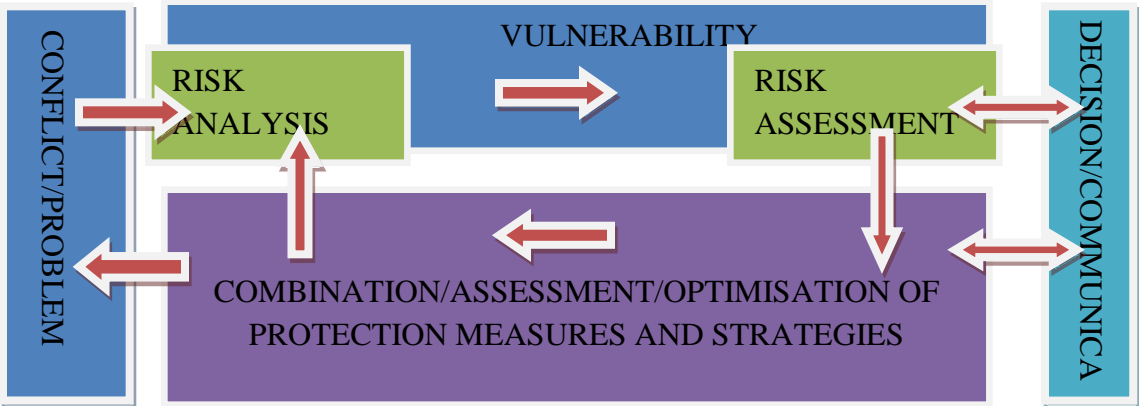
drought, flood and climate change) can act as triggers, rather than causing famines. Because increased risks are caused by human actions, and relate to social vulnerability and to pre-existing ‘normal’ level of hazards. In other words human action is responsible for both the generation of peoples’ vulnerability and the increased level of hazard (Blaikie et al., 2004).

2.2.3 Systems Theory

A system may be defined as a set of social, biological, technological or material partners co-operating on a common purpose. System theory is a philosophical doctrine of describing systems as abstract organizations independent of substance, type, time and space. Systems theories are connected to both ontological and epistemological views. The ontological view imply that the world consist of “systems” or “integrative levels”. The epistemological view implies a holistic perspective emphasizing the interplay between the systems and their elements in determining their respective functions.

Due to natural disasters, such as drought and famine, there is need to create a network for applied research, implementation, and dissemination in the field of disaster risk management. The planned work should shift away from the post-disaster response towards an integrated risk management and sustainable risk prevention culture. The starting point of an integral risk management concept is the relation between hazard, vulnerability, risk and risk management. The approach of the World Institute for Disaster Risk Management (DRM) includes the Systems Approach Model by Wilhelm C., 1999.

Figure 2. 1: Systems Approach Model (Wilhelm C., 1999)



The model links together the elements risk analysis, vulnerability, and risk assessment. It requires the development of tools for an overall risk mitigation. The development of methods and measures to support prevention and intervention activities such as monitoring, registration, forecasting, early warning, and decision-supporting tools for frontline decisions becomes particularly important. Efficient risk management requires a careful evaluation of the vulnerability of the objects and of the systems at risk. Cost-benefit analyses of prevention measures can only be performed on the basis of a quantitative evaluation of possible damage to structures and entire systems.

Vulnerability is a concept still lacking clear scientific definition and theory that allows precise quantification. This is especially true of indirect damage costs, e.g. damage to society, loss of market share due to destruction of production facilities, and of cost estimates of damage to cultural heritage and to environmental systems. Risk assessment consists of an enlarged method to understand the potential effects of natural hazards on human activities and on the environment. The main goal includes developing techniques that allow the most appropriate allocation of available resources in order to optimise the protection of a number of assets. This is a classical economic question. Hazard assessment is based on the study of natural hazards interacting at different spatial and temporal levels, varying on the local, regional, and international scale. Individual hazards and physical processes have been studied individually. Today, this is the core activity of a great number of research institutes. Therefore, DRM supports the multidisciplinary understanding and integrated analyses of different processes. From there innovation should come.

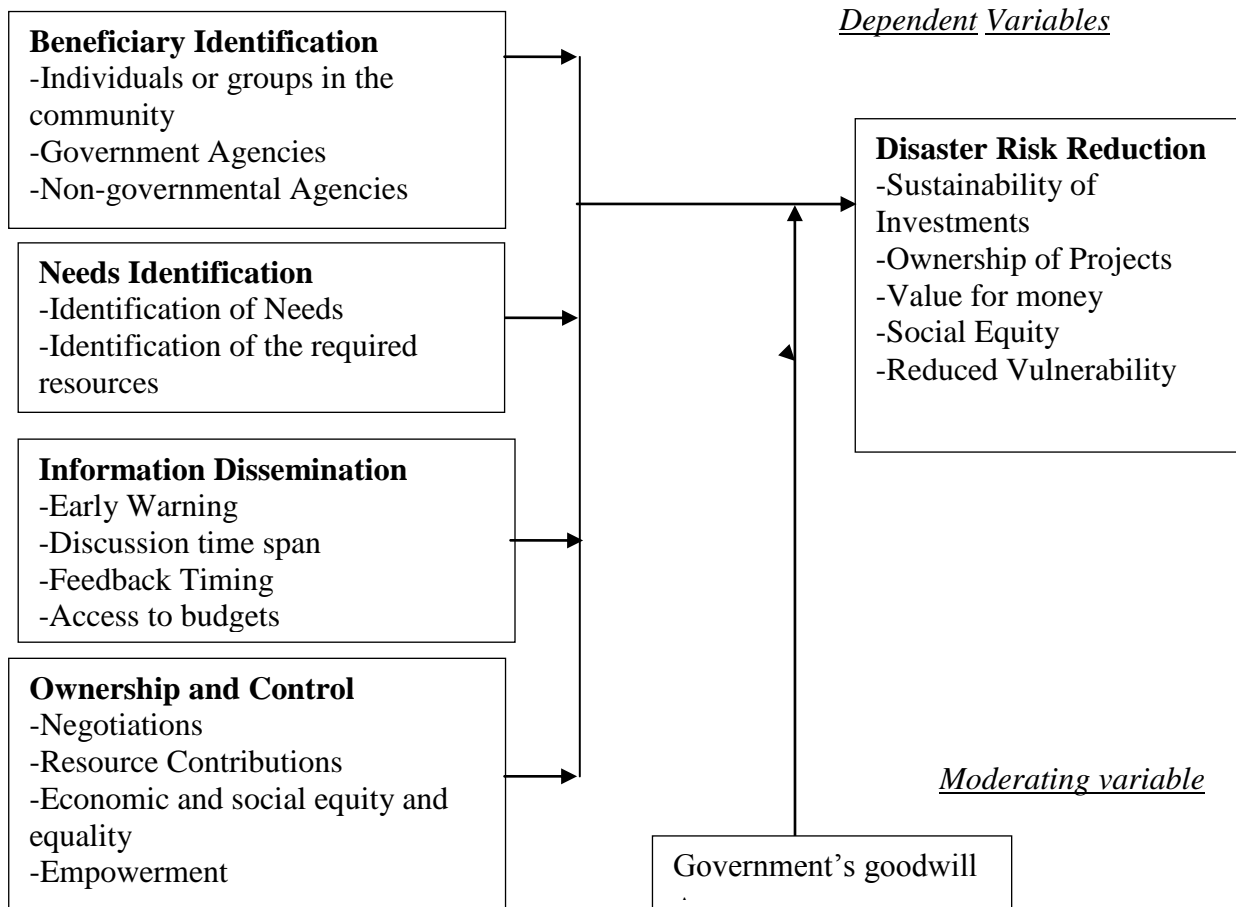
2.3 Conceptual Framework

This conceptual framework, in figure 2.2, is a graphical representation of the elements of community participation that define the role of community participation in management of drought risk reduction. Drought risk reduction is the dependent variable in the study that depends on the roles of community participation in beneficiary identification, needs identification, information dissemination, and control as the independent variables. The existence of

appropriate policy provisions, government’s goodwill and the prevailing political atmosphere are the moderating variables of the study.

Figure 2. 2: Elements of Community Participation that Define the Role of Community Participation in the Management of Drought Risk Reduction

Independent variables



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter comprised of the study area, study population, research design, sample size and sampling procedures, methods of data collection, research instruments and field work procedure and data analysis.

3.2 Study Site

This study was carried out in Kitui County on the lower eastern parts of Kenya. Kitui County is the sixth largest in terms of size and covers an area of 30,520 square kilometers. It is 11th in population size at 1,000,012 based on 2009 censuses and has steadily grown since. The county is diverse with some areas being semi-arid and mostly dry, while others are fairly arable. The periods falling between June to September and January to March are usually dry.

The annual mean minimum temperatures range from 22 -28°C, while the annual mean maximum temperatures range from 28 - 32° C. Due to limited rainfall and high temperatures, surface water sources are very scarce and limited to seasonal rivers that form during the rainy seasons and drying up immediately after rains. River Athi is the only perennial river in the region and flows along the border with Machakos County. The County has no lake, but has several dams that play a significant role in water supply and storage. However, most of the dams dry up during dry season due to high evapo-transpiration rates and seepage (ROK, 2010). Kitui County had an estimated population of 1,012,709 people, and over 205, 491 households (ROK, 2009)

3.3 Research Design

This is a case study which used descriptive research design. Descriptive design helped in investigating the impact of drought and famine in Kitui County and the resilience measures adopted to counteract the impact of drought. Descriptive research design provide deep understanding of the events been studied and its instruments are helpful in getting first-hand experience as well as in depth coverage of the study (Kothari, 2004). This research design is a present oriented methodology that the researcher used to investigate disaster preparedness and resilience amongst communities in Kitui County by selecting a sample population. The design helped the researcher to establish conditions that exist, practices that prevail, beliefs and attitudes

that are held, processes that are ongoing and trends that are developing. The research design provided numeric descriptions of the sample population by describing the role of the community, government and NGOs in the management of drought in Kitui. Kothari also notes that this method has the ability to allow collection of large amount of data quickly and at minimal costs. The researcher opted for a descriptive survey design to cater for the large population that will be involved in the study through a sample for the purpose of data collection and analysis.

3.4 Unit of analysis and Unit of observation

The unit of analysis is the major entity that is being analyzed in a study. It is the 'what' or 'who' that is being studied. In social science research, typical units of analysis include individuals (most common), groups, social organizations and social artifacts. The literature of international relations provides a good example of units of analysis. The unit of analysis in the study was the farmers. This should not be confused with the unit of observation, which is the unit described by one's data (neighborhoods using the U.S. Census, individuals using surveys, etc.). For example, a study may have a unit of observation at the individual level but may have the unit of analysis at the neighborhood level, drawing conclusions on neighborhood characteristics from data collected from individuals. The unit of observation in the study was the household level.

3.5 Target Population

The study targeted Kitui county residents in three districts which include; Mutomo, Ikutha and Lower Yatta. The group of respondents included 150 farmers who provided relevant data for the study as they have experienced drought and famine in the area and have seen the resilience measures adopted to curb the impact of drought and famine. The study was aimed at establishing the effects agricultural production has on the living standards and household welfare of the farmers of Kitui County and therefore some of the household characteristics studied included; age, education level, gender of the head of the household, family size, years of farming experience, and wealth. Lower Yatta has a population of 18,765 people, Ikutha district has a population of 26,176 people and Mutomo district has a total of 24,450 people according to the 2009 census report.

Table 3. 1: Total Population of Mutomo, Ikutha and Lower Yatta Districts

Districts	Total Population	Sample Size(<i>n</i>)	Percentage (%)
Lower Yatta	18,765	40	27.04
Ikutha	26,176	57	37.72
Mutomo	24,450	53	35.24
Total	69,391	150	100

3.6 Sample Size and Sampling Procedure

According to Bryman (2008), sampling is the process of selecting a number of individuals for a study in such a way that the individual represents a larger group from which they are selected. The major criterion used when deciding on the sample size is the extent to which the sample size represents the population. The researcher used random sampling technique to gather data from the target population. According to Mugenda and Mugenda (2005) a third of the population is an ideal sample. The sampling technique is the process of selecting a specific number of respondents for a study (Ngulube, 2003). The study employed simple random sampling technique to collect data from 150 farmers. Simple random sampling was conducted to ensure that each member of the target population had equal and independent chance of being included to produce unbiased sample of study.

The researcher did not possess a list of households in the area under study. Therefore, the researcher used population estimates from the last census report of Mutomo, Ikutha and Lower Yatta districts. The researcher also did not possess the number of households in each sub area and therefore she identified the midpoint (market, school or church) in each district and then proceeded to divide the area into 4 sub areas (North, South, East, West). The number of households to be included in each sub area was obtained by dividing the sample size in each district by 4. For example, Lower Yatta had a sample size of 40 and dividing this by 4 means 10 households per sub-area. Once, the researcher had the number of households from each sub-area,

she then used a distance of 500m between households to select the intended number of households. The researcher used a path from the mid point which is frequented used by many residents to go to their homes. The path assisted the research in calculating distance between households and also helped in identifying boundaries.

3.7 Methods of Data Collection

Data was collected through interviews with key informants, focus group discussions (FGDs) and household questionnaire survey. Key informant interviews were conducted with a broad variety of stakeholders comprising of; government officials, local and international NGOs and CBOs. The interviews were aimed at getting insights into the impact of drought in the county and their efforts to assist the communities in coping with the disaster. During the field study, ten key informants were interviewed and focus group discussions held comprising of eight farmers. Data was also collected through household survey using semi-structured questionnaires that provided the basis for a quantitative characterization of household's socio-economic characteristics, perceptions of climate change and coping mechanisms of the household heads.

3.7.1 Collection of quantitative data

The study used semi-structured questionnaires to collect data from the households. Mugenda and Mugenda (2003) observed that, the pre-requisite to questionnaire design is definition of the problem and the specific study objectives. Kothari (2004) observed that questionnaires are very economical in terms of time, energy and finances. Questionnaires yielded quantitative data which was easy to collect and analyze.

3.7.2 Collection of qualitative data

Data collection approaches for qualitative research usually involves:

1. Direct interaction with individuals on a one to one basis
2. Or direct interaction with individuals in a group setting

Qualitative research data collection methods are time consuming, therefore data is usually collected from a smaller sample than would be the case for quantitative approaches - therefore this makes qualitative research more expensive. The benefits of the qualitative approach are that

the information is richer and has a deeper insight into the phenomenon under study. The two types of qualitative techniques used in the study included:

a) Key informants

The term “key informant” in this study refers to a person who disposes specific competence/knowledge of drought and famine, its impacts and response mechanisms due to academic qualifications or/and many years of work experience. The interviews were aimed at getting insights into the impact of drought in the county and their efforts to assist the communities in coping with drought and famine. During the field study, ten key informants were interviewed using an interview guide. They were selected using purposive selection. The key informants included; government officials, local and international NGOs and community based organizations.

b) Focus Group Discussions

A focus group discussion is an interview with a small group of people usually eight to twelve people participate in the interview for about one to two hours. The interviews are expected to yield higher response rates by using probing questions (Patton, 1990). Patton argues that focus group discussion is the highly efficient qualitative data collection technique, which provides some quality controls on data collection. Participants tend to provide checks and balances on each other and it is fairly easy to assess the extent to which there is a relatively consistently shared view among the participants. During the study, the researcher held focus group discussions with eight farmers who experienced drought and famine in the region. The discussions were on the following topics; community participation, coping mechanisms, impact of drought and famine on the lives of the community and their understanding of drought and famine. The researcher used snowballing sampling as a means of identifying the group participants. The researcher encouraged the respondents to participate without holding back the information they might be having as the research instruments would not bear their names.

3.8 Ethical considerations

According to Kerridge, Lowe and McPhee (2005), ethic involves making a judgment about right and wrong behavior. Ethics as noted by Minja (2009) is referred to, as norms governing human conduct which have a significant impact on human welfare. Indeed as observed by Devettere

(2000), ethics is about choice between good and bad. In this study, the researcher followed ethical considerations in the course of the data collection process. Respondents participated on their own will without coercion from either the researcher or their supervisors. The researcher protected the privacy and confidentiality of the respondents' identities.

3.9 Data Processing and Analysis

Mugenda and Mugenda (2003) assert that data obtained from the field in raw form is difficult to interpret unless it is cleaned, coded and analyzed. The collected data was analyzed using both quantitative and qualitative data analysis methods. Quantitative method involved descriptive analysis. Descriptive analysis such as frequencies, percentages were used to present quantitative data in form of tables. Data from questionnaire was coded and logged into the computer using Statistical Package for Social Science (SPSS).

Qualitative data was collected and analyzed using content analysis. According to Creswell (2003), content analysis is a research technique used to determine the presence of certain words or concepts within texts or set of texts. The researcher quantified and analyzed the presence, meanings and relationships of such words and concepts then make inferences about the messages within the text. To conduct a content analysis on any such text, the text was broken down into manageable categories on a variety of levels; word, word sense, phrase, sentence or theme and then examined using content analysis.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter discussed the interpretation and presentation of the findings obtained from the field. The chapter presented the background information of the respondents; findings of the analysis based on the objectives of the study that included disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and education status of the people of Kitui County.

4.1.1. Response Rate

The table 4.1 below represents the findings of the response rate of the research study. The study targeted a sample size of 150 respondents from which 115 filled in and returned the questionnaires making a response rate of 77%. This response rate was satisfactory to make conclusions on the disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and education status of the people of Kitui County. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. Based on the assertion, the response rate was considered to excellent.

Table 4. 1: Response Rate

Response	Frequency (n)	Percentage (%)
Response	115	76.7
Non Response	35	23.3
Total	150	100.0

4.2. Characteristics of Respondents

4.2.1 Gender of the Respondents

A total of 115 respondents from Mutomo, Ikutha and Lower Yatta were interviewed. Table 4.2 shows that the majority of the respondents as shown by 53.9% (62) indicated that they were female whereas 46.1% (53) of the respondents indicated that they were, male. This is an indication that both genders were involved in assessing disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and educational status of

the people of Kitui County. It's important to involve both genders while conducting a study in order to be representative (Okello 2010). Most cultures in Kenya dictate that men should be the heads of the household. In addition, men have a better access to land, assets, education and other critical services such as credit, technology and input supply. This therefore qualifies them to be the main decision makers in the household (FAO, 2010). In Kitui County the high number of women as heads of households dictates that women are not able to make decisions on disaster preparedness and resilience.

Table 4. 2: Distribution by Gender of the Respondents

Gender	Frequency (n)	Percentage (%)
Female	62	53.9
Male	53	46.1
Total	115	100.0

4.2.2 Age of the Respondents

According to Table 4.3 on the age of the respondents, the study requested the respondents to indicate their age category, from the findings, it is clear that most of the respondents as shown by 35.7% (41) indicated that they were aged between 40 to 49 years, 19.1% (22) of the respondents indicated 30 to 39 years, 15.7% (18) indicated they were aged 50 to 59 years, 10.4% (12) indicated 60 to 69 years, 7.8% (9) indicated 20 to 29 years, 5.2% (6) indicated that they were aged 70-79 years, 3.5% (4) indicated that they were aged above 80 years whereas 2.6% (3) of the respondents indicated they were aged 10-19 years.

This is an indication that respondents were well distributed in term of their age. In terms of implementation of disaster preparedness and resilience strategies. In Kitui County there is a large population of household heads below 50 years such a population is likely to be more willing to access information on disaster preparedness and resilience strategies as compared to their elderly counterparts (Onu, 2007).

Table 4. 3: Distribution of the Respondents by Age

Age of the Respondents	Frequency(n)	Percentage (%)
10-19 years	3	2.6
20-29 years	9	7.8
30-39 years	22	19.1
40-49years	41	35.7
50-59years	18	15.7
60-69years	12	10.4
70-79years	6	5.2
80+	4	3.5
Total	115	100

4.2.3 The Number of Years the Respondents Have Lived In the Community

Table 4.4 below indicates respondents' period of living in the community, from the findings, it is clear that most of the respondents as shown by 53.9% (62) had lived for 11 years, 27% (31) of the respondents indicated they had stayed for between 6 -10 years, 13.9% (16) had lived for 1-5 years whereas 5.2% (6) of the respondents indicated they had lived for less than an year.

This is an indication that respondents had lived in the community for a good time and thus understood the disaster preparedness and resilience in Kitui County and its effect on agricultural production, living standards and education status of the people of Kitui County. Most of the household heads had lived in the community for more than 11 years and are therefore expected to have a better adaptation to climate variability owing to the fact that experienced residents are expected to have more knowledge and information about climate variability. The knowledge of climate variability will enable the residents in Kitui County to be prepared for disasters and resilience (Maddison, 2006).

Table 4. 4: The Number of Years the Respondents Have Lived In the Community

Response	Frequency(n)	Percentage (%)
Below one year	6	5.2
1-5 years	16	13.9
6-10 years	31	27.0
11+ years	62	53.9
Total	115	100.0

4.2.4 Marital Status of the Respondents

Table 4.5 illustrates the marital status of the respondents, the study requested the respondents to indicate their marital status, from the findings, the study found that most of the respondents as shown by 70.4% (81) indicated they were married, 15.7% (18) indicated they were single, 8.7% (10) indicated they were widowed, whereas 5.2% (6) of the respondents indicated they were divorced, this is an indication that most of the respondents were married.

Tizale (2007) noted that when the head of the household is married is able to consult the spouse and make good decisions concerning disaster preparedness and resilience. Most cultures in Kenya dictate that men should be married unlike women thus when men are the heads of the households and have a better access to land, assets, education and other critical services such as credit, technology and input supply will enable them make good decisions (FAO, 2010).

Table 4. 5:Marital Status of the Respondents

Marital Status	Frequency(n)	Percentage (%)
Single	18	15.7
Married	81	70.4
Divorced/Separated	6	5.2
Widow/ Widower	10	8.7
Total	115	100.0

4.2.5 Education status of the respondents

Table 4.6 represents the education level of respondents per gender, the study found that 34.0% (18) male heads had primary education compared to 35.5% (22) female heads. On secondary education, 26.4% (12) male heads had secondary compared to 19.4% (12) female heads. On college education, 18.9% (10) male heads had college education compared to 11.3% (7) female heads that had college education. On university education 7.5% (4) male heads had university education compared to 4.8% (3) female heads. On the respondents who had no education 13.2% (7) male lacked education compared to 29.0% (18) female.

Most of the Kenyan cultures especially in the rural sector don't value girl child education compared to the boy child hence the higher percentage of female with no education compared to the male. The lack of enough formal education, as most of the respondents had attained only primary education is a major cause of lack of decisiveness on disaster preparedness and resilience in Kitui County. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience (FAO, 2010).

Table 4. 6: Education level of Respondents per Gender

Education of the Respondents	Gender				Total	
	Male		Female		N	Percentage
	N	Percentage	N	Percentage		
Primary	18	34.0	34	35.5	40	34.8
Secondary	14	26.4	26	19.4	26	22.6
College	10	18.9	19	11.3	17	14.8
University	4	7.5	8	4.8	7	6.1
None	7	13.2	13	29.0	25	21.7
Total	53	100.0	100	100.0	115	100.0

4.2.6 Socio-Economic Characteristics

4.2.6.1 The main assets Found in Kitui County

Table 4.7 shows the main assets found in Kitui County, the study found that the main assets found in Mutomo District include houses, farm equipments, livestock, land, businesses and bicycles. Generally most people in Mutomo District had houses as represented by 84% the rest had rental houses. 76% of the households owned at least some land where 69% practiced some farming and 58% reared livestock. Finally 18% household heads had business and 7% had bicycles.

The study also revealed that the main assets found in Lower Yatta include houses, farm equipments, livestock, land, businesses and bicycles. Generally most people in Mutomo District had houses as represented by 73% the rest had rental houses. 67% of the households owned at

least some land where 62% practiced some farming and 51% reared livestock. Finally 32% household heads had business and 14% had bicycles.

The study finally revealed that the main assets found in Ikutha District include houses, farm equipments, livestock, land, businesses and bicycles. Generally most people in Ikutha District had houses as represented by 77% the rest had rental houses. 71% of the households owned at least some land where 66% practiced some farming and 55% reared livestock. Finally 25% household heads had business and 9% had bicycles.

Table 4. 7: The main assets Found in Kitui County

	Mutomo	Lower Yatta	Ikutha
Assets	Percentage		
Houses	84.00%	73.00%	77.00%
Land	76.00%	67.00%	71.00%
Farm equipment	69.00%	62.00%	66.00%
Businesses	18.00%	32.00%	25.00%
Livestock	58.00%	51.00%	55.00%
Bicycles	7.00%	14.00%	9.00%

4.2.6.2 Dependency on Crop Farming in Kitui County

Table 4.8 shows the dependency of crop farming in Kitui County. The study found 66.1% (76) of the respondents depended on crop farming compared to 33.9% (39) that didn't depend on crop farming. The key informants stated that most people depend on crop farming due to poverty in the region since they cannot be able to access financial services such as loans from banks to start a business in the county. The key informants further stated that the high dependency of the household heads on crop farming is the cause of famine and poverty in Kitui County since the County is prone to drought and when drought strikes it leads to famine and poverty since the residents have no other source of income.

Kitui County being an agricultural based rural community, the available options in crop farming are adversely affected by a changing climate; small scale businesses and labor opportunities are

the most probable alternative livelihood opportunities to reduce their vulnerability and enhance their resilience, though this is dependent on other socio-economic factors that might reduce on the opportunities that they would like to diversify.

Table 4. 8: Dependency on Crop Farming in Kitui County

Response	Frequency(n)	Percentage (%)
Yes	76	66.1
No	39	33.9
Total	115	100.0

4.2.6.3 The Number of Mud Walled Houses

According to Table 4.9 the number of mud walled houses 49% (56) mud walled compared to 51% (59) that were not mud walled. The mud walled houses were spread across the three districts in Kitui County indicating poverty. The increased poverty in the region leads to inability to access education and other critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience (FAO, 2010).

Table 4. 9: The Number of Mud Walled Houses

Mud Walled Houses	Frequency(n)	Percentage (%)
Yes	56	48.7
No	59	51.3
Total	115	100.0

4.2.6.4 The Main Source of Cooking Fuel

Table 4.10 shows that on the main source of cooking fuel an overall of 69% (79) respondents in Kitui County used firewood as source of fuel indicating poverty was spread across the 3 districts compared to 31% (36) who didn't use firewood. The key informants indicated that they used firewood as a source of fuel since they could not be able to access other sources of fuel such as gas which are eco friendly. Furthermore those who didn't use firewood used charcoal as a source

of fuel. The increased use of firewood as source of fuel has led to environmental degradation leading to drought and hence famine in Kitui County.

Table 4. 10: The Main Source of Cooking Fuel

Firewood as a Source of Fuel	Frequency (n)	Percentage (%)
Yes	79	69
No	36	31
Total	115	100

4.3 Control Measures Adopted To Help In Curbing Drought and Famine

4.3.1 Action taken in times of Food Shortage

Table 4.11 shows the action taken in times of food shortage, the study requested the respondents to indicate the action taken in times of food shortage, from the findings, it is clear that most of the respondents as shown by 63.5% (73) indicated they beg food relief from government, 23.5% (27) indicated they begged assistance from relatives, friends or neighbours, while 13% (15) indicated they bought food. This is an indication that most residents begged food in times of shortage hence there should be measures to conserve the environment hence reduce drought and famine.

The key informants who were government officials, local and international NGOs and community based organizations also indicated that in times of food shortage there is creation of awareness and distribution of food in the region which is done mostly by the government ministries. The ministry of agriculture is mostly involved in this process. Ministry, department of water also plays a major role in the distribution of water and creation of awareness on environmental conservation. The stakeholders also introduce education to the community on the involvement of growing drought resistant crops to help boost the food supplies of the community. Farmers are given the civic education and knowhow of how to manage farming in water scarce areas. They are provided with the necessary facilities and resources by the government to manage the small scale farming.

Table 4. 11: Action taken in times of Food Shortage

Response	Frequency(n)	Percentage (%)
Buy food	15	13.0
Beg assistance from relatives, friends or neighbours	27	23.5
Beg food relief from government	73	63.5
Total	115	100.0

4.3.2 Contribution of the Community towards Intervention

From the table 4.12 below on the contribution of the community towards intervention, it is clear that most of the respondents as shown by 36.5% (42) indicated they contributed labour, 27% (31) indicated they contributed information, 17.4% (20) contributed materials, 10.4% (12) contributed training, 6.1% (7) contributed funds while 2.6% (3) had nothing to contribute. This is an indication that most residents had something to contribute towards the interventions to conserve the environment hence reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations indicated that the community provided labour and information which is done mostly through disaster management committee formed under supervision of the ministries and also educating the community as a whole. Water committees are also formed in the area so that they can be responsible of the water conservation initiatives that are introduces through projects which can reduce drought hence food shortage.

Table 4. 12: Contribution of the Community towards Intervention

Response	Frequency(n)	Percentage (%)
Labour	42	36.5
Funds	7	6.1
Trainings	12	10.4
Materials	20	17.4
Nothing	3	2.6
Information	31	27.0
Total	115	100.0

4.3.3 Adjustments in Farming Practices to Climate Variability and Change

From the table 4.13 on the adjustments in farming practices to climate variability and change, it is clear that most of the respondents as shown by 59.1% (68) indicated there were adjustments in farming practices to climate variability and change while 40.9% (47) indicated that there were no adjustments in farming practices to climate variability and change. This is an indication that there is need for adjustments in farming practices to climate variability and change to reduce drought and famine.

The key informants who were government officials, local and international NGOs and community based organizations indicated that some community members have resulted to growth of drought resistant crops such as sorghum and millet which would help reduce food shortage in the reduce and also earn the households some income that would help diversify their economic activities. Kitui county being an agricultural based rural community, the available options are adversely affected by a changing climate; small scale businesses and labor opportunities are the most probable alternative livelihood opportunities to reduce their vulnerability and enhance their resilience, though this is dependent on other socio-economic factors that might reduce on the opportunities that they would like to diversify.

Table 4. 13: Adjustments in farming practices to climate variability and change

Response	Frequency(n)	Percentage (%)
Yes	68	59.1
No	47	40.9
Total	115	100.0

4.3.4 Adjustments made in farming practices to long-term shifts in temperature and rainfall

From the table 4.14 on the adjustments made in farming practices to long-term shifts in temperature and rainfall, it is clear that most of the respondents as shown by 77.4% (89) indicated there was irrigation, 67.8% (78) indicated there was change crop variety, 53% (61) indicated that there was diversification of crop types and varieties, 41.7% (48) indicated there were changes in size of land under cultivation, 40.9% (47) indicated there were diversification of

livestock types and varieties, 33% (38) they built water harvesting schemes, 31.3% (36) indicated there were changes in planting dates, 29.6% (34) indicated they implemented soil conservation schemes, 23.5% (27) indicated they diversified from farming to non-farming activity while 20% (23) indicated that they had reduced number of livestock. This is an indication that there were changes in adjustments made in farming practices to long-term shifts in temperature and rainfall to reduce drought and famine.

The key informants who were government officials, local and international NGOs and community based organizations indicated that with the changing climate and inherent risks associated with rain fed agriculture, the percentage found in the study show an equal number of households are embracing the use of drought resistant agricultural practices as those who still use the regular farming practices. With the cyclic droughts being experienced in the County, poor performance of rainy seasons, multiple re-planting routines, drought resistant agriculture farming practice would be an appropriate risk reduction initiative that would help reduce the high risks of food insecurity; as was found in the study on the number of people who are food insecure during droughts.

The key informants who were government officials, local and international NGOs and community based organizations further stated that any adaptation efforts in farming practices that can reduce community vulnerability to succeed, it will require there to be changes in agricultural processes, changes in existing social practices and environmental processes, changes in the perceptions of the community towards the inherent risks resulting from a changing climate, changes to the community cultural and traditional practices and activities that ultimately reduce potential damages or provide communities with diverse methods of farming such as irrigation, crop rotation etc.

Table 4. 14: Adjustments made in farming practices

Response	Frequency (n)	Percentage (%)
Change crop variety	78	67.8
Build water harvesting schemes	38	33.0
Implement soil conservation schemes	34	29.6
Diversification of crop types and varieties	61	53.0
Diversification of livestock types and varieties	47	40.9
Changing planting dates	36	31.3
Changing size of land under cultivation	48	41.7
Irrigation	89	77.4
Reduce number of livestock	23	20.0
Diversify from farming to non-farming activity	27	23.5

4.3.5 Main Constraints to Adaptation Measures

From the table 4.15 below on the main constraints to adaptation measures, it is clear that most of the respondents as shown by 50.4% (58) indicated lack of access to water, 28.7% (33) indicated lack of capital, 28.7% (33) indicated that lack of capital was a major constraint, 14.8% (17) indicated lack of information, 4.3% (5) indicated shortage of labour while 1.7% (2) indicated poor health. This is an indication that lack of access to water was a major concern to adaptive measures hence need for interventions to conserve the environment and reduce drought and famine. The government can also build borehole to facilitate irrigation.

From the results the key informants who were government officials, local and international NGOs and community based organizations stated that, capital and lack of access to water inhibit adaptive measures. Most of the households in the County have an appreciation on the need for monetary savings as an alternative backup, which could come in handy during crisis times especially drought. Also the community way of livelihood acted as a hindrance to effective water conservation as they do not pay attention to water demanding activities. Much of the water present is directed to livestock management and household needs which do not give the morale for water conservation. During drought seasons, the communities rely greatly on the government for survival and many deaths occur due to this reason as they have only one way of livelihood.

Table 4. 15: Main Constraints to Adaptation Measures

Response	Frequency(n)	Percentage (%)
Lack of capital	33	28.7
Lack of information	17	14.8
Shortage of labour	5	4.3
Lack of access to water	58	50.4
Poor health	2	1.7
Total	115	100.0

4.3.6 Challenges and Successes during the Current Response to Drought

The study established that failure to involve all stakeholders in responding to drought has been major challenge. Community participation in drought disaster risk management has also been ignored and emphasis has been on emergency relief and response. The affected communities have also become too weak when drought strikes and unilateral declaration by project administration without listening to people’s responses which would involve communities has also been a challenge. Failure to implement the recommendations made has also been a major challenge. On the success there has been building of boreholes which has increased access to water for the community. Irrigation has also been implemented and conservation of environment has also been implemented. From the study, it can be deduced that households with alternative financial resources tend to be better placed in comparison to those with no alternative sources; this is clearly witnessed during any crisis. Those households with alternative cash sources are able to purchase the basic necessities as opposed to those without, who ultimately end up relying on external assistance for their basic needs. The key informants who were government officials, local and international NGOs and community based organizations indicated that some community members have resulted to growth of drought resistant crops such as sorghum and millet which would help reduce food shortage in the reduce and also earn the households some income that would help diversify their economic activities.

4.4 Role of NGOs in Counteracting Drought and Famine in the County

4.4.1 Institutions/ Organizations the Community has worked with to address climate change

From the table 4.16 below on whether there are institutions/organizations the community has worked with to address climate change, it is clear that most of the respondents as shown by 71.3% (82) indicated there were institutions the community has worked with to address climate change while 28.7% (33) indicated there were institutions. This is an indication that the community has worked with institutions to address climate change and reduce drought and famine. The participation of the NGOs and other organizations in the community in addressing climate change means that the community is given resources informs of information and financial services thus the members in the community are able to diversify their activities hence they are in a better position of disaster preparedness and resilience.

Table 4. 16: Institutions the Community Has Worked With to Address Climate Change

Response	Frequency(n)	Percentage (%)
Yes	82	71.3
No	33	28.7
Total	115	100.0

4.4.2 Type of Institutions/ Organizations to Address Climate change

From the table 4.17 below on the type of institutions/ organizations used to address Climate change, it is clear that most of the respondents as shown by 44.3% (51) indicated the institution used was NGO, 37.4% (43) indicated government ministries were used, 13% (15) indicated the private sector was used while 5.2% (6) indicated it was the contribution of the individuals in the community. This is an indication that there are institutions within the community used to address climate change and reduce drought and famine.

Table 4. 17: Type of Institutions/ Organizations to Address Climate change

Response	Frequency(n)	Percentage (%)
NGOs	51	44.3
Government ministry	43	37.4
Private sector	15	13.0
An individual	6	5.2
Total	115	100.0

4.4.3 How the organization helped the community in coping with drought

The study found that the organizations have supported the community in coping with drought through various measures such as conducting forum and sensitizing the locals on the need of conserving the environment through planting of trees and eliminating deforestation which is a major cause of drought. The organizations have also built boreholes to the locals to increase the water content for the community where the residents can irrigate their lands. The key informants who were government officials, local and international NGOs and community based organizations indicated that in coping with drought the residents have empowered the residents to grow drought resistant crops which can cope under harsh weather conditions. The organizations further strengthen the need for diversification of income generating activities and livelihood strategies for households and communities living in Kitui County, in situations with limited income generating opportunities, it is usually a vulnerable households limited productive assets' that are at the greatest risk from the negative impacts of drought.

4.4.4 Negotiations and discussions about Disaster risk management interventions

From the table 4.18 below on whether there were negotiations and discussions about disaster risk management interventions in the area, it is clear that most of the respondents as shown by 70.4% (81) indicated there were some interventions, 29.6% (34) indicated there were no interventions. This is an indication that there are some negotiations and discussions about disaster risk management intervention which helps to reduce drought and famine but there should be more interventions. The key informants who were government officials, local and international NGOs and community based organizations indicated that the organizations have requested the residents to diversify their income through engaging in other business generating income activities apart

from crop farming. The communities are also advised to save money which would be useful to the households in times of disaster.

Table 4. 18: Negotiations and Discussion about Disaster Risk Management Interventions

Response	Frequency(n)	Percentage (%)
Yes	81	70.4
No	34	29.6
Total	115	100.0

4.4.5 Proposal for Disaster risk management interventions

From the table 4.19 below on the proposals for disaster risk management interventions, it is clear that most of the respondents as shown by 35.7% (41) indicated the proposals came from NGOs, 27% (31) indicated politicians, 16.5% (19) indicated the proposals came from the governments, 11.3% (13) they came from the community, 5.2% (6) while 4.3% (5) indicated they got the proposals from the politicians. This is an indication that most proposals came from NGOs hence other stakeholders should bring proposals for disaster risk management. The key informants who were government officials, local and international NGOs and community based organizations indicated that there is need for safety net programs that communities and households are well aware of, and they are able to tap in for assistance. This should be realized during the disaster phase and post-disaster phase of a crisis and thus the communities would benefit, such activities would not necessarily lift them out of poverty but they are required as risk reduction measures to cushion them from the negative impacts of drought. This should however not be confused with the regular emergency relief, and can be introduced in the community using innovative but sustainable means, as risk reduction measures that the community will be able to have the acceptable indicators or triggers to use to gain access to assistance.

Table 4. 19: Proposal for Disaster Risk Management Interventions

Response	Frequency(n)	Percentage (%)
Community	13	11.3
Chief	6	5.2
Government	19	16.5
NGO	41	35.7
Elders	5	4.3
Politicians	31	27.0
Total	115	100.0

4.4.6 Residents' Understanding of Climate Change

From the table 4.20 below on whether the clients understand climate change, it is clear that most of the respondents as shown by 62.6% (72) indicated they understood climate change while 37.4% (43) indicated they didn't understand. This is an indication that some of the residents didn't understand climate change hence there is need for education about climate change to reduce disasters and manage them. The key informants who were government officials, local and international NGOs and community based organizations indicated most of the residents understand climate change and have inherent abilities and disabilities to deal with climate variability and a changing climate, with adaptive capacities being unevenly distributed across households. However, the most vulnerable households in a community who traditionally are the poor and most at risk, are highly vulnerable to the negative impacts of a changing climate, as a result of the underlying factors that inhibit their capacity to sufficiently cope with the emerging climatic conditions.

Table 4. 20: Residents' Understanding of Climate Change

Response	Frequency(n)	Percentage (%)
Yes	72	62.6
No	43	37.4
Total	115	100.0

4.5 The Effect of Drought and Famine on Agricultural Production in the County

4.5.1 Food Crop Grown in the Community

From the table 4.21 below on the food crop grown in the community, the study requested the respondents to indicate the food crop they grow, from the findings, it was deduced that most of the respondents as shown by 77.4% grew maize, 67.8% indicated they grew beans, 37.4% indicated they grew millet while 32.2 % indicated they grew cassava. This is an indication that the region is dry as these crops thrive in dry regions. The key informants who were government officials, local and international NGOs and community based organizations indicated that only drought resistant crops can thrive in Kitui County since the area is prone to drought and has infertile soil. Further most farmers don't engage in cash crops since they don't have enough food for their families.

Table 4. 21: Food Crop Grown in the Community

Response	Frequency(n)	Percentage (%)
Maize	89	77.4
Beans	77	67.8
Millet	43	37.4
Cassava	37	32.2

4.5.2 Fertility of the Land

From the table 4.22 below on the fertility of land, the study requested the respondents to indicate the fertility of their land, from the findings, it is established that most of the respondents as shown by 70.4% (81) indicated the land was infertile, 23.5% (27) indicated the land was fertile while 6.1% (7) indicated the land was very fertile. This is an indication that the infertility of the land was high, the reason for the residents being unable to grow sufficient food crops leading to famine. The key informants who were government officials, local and international NGOs and community based organizations indicated although most of the land is infertile most farmers in the county practice traditional farming methods, with low use of mechanized farming and application of fertilizer, a factor which results in low output per acreage in comparison to those practicing modern farming approaches. Introduction of inexpensive and easily adaptable risk reduction methods, such as conservation agriculture, would help in food security.

Table 4. 22: Fertility of the Land

Response	Frequency(n)	Percentage (%)
Very fertile	7	6.1
Fertile	27	23.5
Infertile	81	70.4
Total	115	100.0

4.5.3 Sources of Agricultural Extension Officers/Services

From the table below 4.23 on the sources of agricultural extension officers/services, the study requested the respondents to indicate the sources of agricultural extension officers/services, from the findings, it is clear that most of the respondents as shown by 61.7% (71) sourced agricultural extension services from the government, 27% (31) indicated NGOs while 11.3% (13) indicated private sector. This is an indication that the government is committed to giving the residents agricultural extension officers/services to end poverty. The key informants who were government officials, local and international NGOs and community based organizations indicated that as a result of drought, conservation agriculture has been used which provides benefits, like higher produce yields, preservation of the soil quality and less man hours spent by the farmers in the farm. It could be adopted by vulnerable communities, and if well introduced into the county this method of farming would help counter the negative climatic conditions and create opportunities for more food production hence reducing the high levels of food insecurity.

Table 4. 23: Sources of Agricultural Extension Officers/Services

Response	Frequency(n)	Percentage (%)
Government	71	61.7
Private	13	11.3
NGO	31	27.0
Total	115	100.0

4.5.4 Household Food Shortage Experience

From the table 4.24 below on whether the household experience food shortage, it was established that most of the respondents as shown by 66.1% (76) faced food shortage while only 33.9% (39)

indicated they didn't face food shortage. This is an indication that the poverty level was high as most people faced food shortage and hunger this could be due to drought and infertility of the land. The key informants who were government officials, local and international NGOs and community based organizations indicated access to sufficient food is critical for households to hold together, lack of sufficient food at the household level eventually moves to the community and other higher levels of the society, which eventually leaves majority of the people without enough food to eat. As a consequence, the affected populations eventually resort to negative ways to cope, and this has a negative impact on the livelihoods of a community, as more resources previously not meant for food are redirected to purchase food and leaving other equally important needs unmet.

Table 4. 24: Household Food Shortage Experience

Response	Frequency(n)	Percentage (%)
Yes	76	66.1
No	39	33.9
Total	115	100.0

4.5.5 Crops Produced as Surplus for Sale in the County

From the table 4.25 below on the crops produced as surplus for sale, the study requested the respondents to indicate the crops they produced as surplus for sale, from the findings, it is came into the researchers attention that most of the respondents as shown by 40.8% (31) sold maize, 28.9% (22) indicated they sold millet, 19.7% (15) indicated they sold cassava while 10.5% (8) indicated they sold beans. This is an indication that at least people in the region could sell some produce thus with support through irrigation and conservation of the environment the residents could have some income and thus reduce poverty. Food security exists when all people, at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2008). With this high percentage of people with no sufficient food, there is no much surplus available for sale.

Table 4. 25: Crops Produced as Surplus for Sale in the County

Response	Frequency(n)	Percentage (%)
Maize	31	40.8
Beans	8	10.5
Millet	22	28.9
Cassava	15	19.7
Total	76	100.0

4.5.6 Reasons for Food Shortage in the County

From the table 4.26 below on the reasons for food shortage, the study requested the respondents to indicate the reasons for food shortage, from the findings, it is clear that most of the respondents as shown by 62.6% (72) indicated it was due to drought, 23.5% (27) indicated lack of farm inputs, 12.2% (14) indicated shortage of land while 1.7% (2) indicated floods. This is an indication that drought was the main cause of the food shortage hence there should be measures to conserve the environment hence reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations indicated that drought and famine has been the talk in the last decade in Kitui County where the residents have suffered a lot from the disaster, there has been in reduction in food production leading which makes the lives of the residents difficult.

Table 4. 26: Reasons for Food Shortage in the County

Response	Frequency(n)	Percentage(%)
Drought	72	62.6
Floods	2	1.7
Lack of farm inputs	27	23.5
Land	14	12.2
Total	115	100.0

4.5.7 Effect of Rainfall days over the last 10 years in the County

From the table 4.27 on the effect of rainfall days over the last 10 years, it was established that most of the respondents as shown by 51.4% (37) indicated there was decrease in rains and change in timing, 18.1% (13) indicated there were changes in the timing of rains, 15.3% (11) indicated that there were change in frequency of droughts/floods, 12.5% (9) indicated the rainfall

had declined, while 2.8% (2) indicated that rainfall had increased. This is an indication that there was change in climate change due to destruction of the environment hence need for interventions to conserve the environment and reduce drought and famine.

The key informants who were government officials, local and international NGOs and community based organizations found that the decrease in rainfall days over the last 10 years has led to frequent droughts in the county and continue to be one of the key challenges affecting development goals, with water and sanitation sector being among the most affected by drought. During drought, residents with no alternative water sources are forced to institute measures that ensure their basic needs are met, however once the available water sources are depleted, people have to get water from alternative sources which are usually further away from the affected households.

Table 4. 27: Effect of Rainfall Days over the Last 10 Years in the County

Response	Frequency(n)	Percentage (%)
Increased	2	2.8
Declined	9	12.5
Change in the timing of rains	13	18.1
Decrease in rains and change in timing	37	51.4
Change in frequency of droughts/floods	11	15.3
Total	72	100.0

4.6 How Drought and Famine Influence the Living Standards of the Community

4.6.1 Main Source of Household Income in the County

According to table 4.28 on the main source of household income, the study requested the respondents to indicate the main source of household income, from the findings, it is clear that most of the respondents as shown by 40.9% (47) indicated the main source of income is crop farming, 22.6% (26) indicated the main source was wages, 18.3% (21) indicated pastoralism, 11.3% (21) indicated business while 7% (8) indicated the main source was salary.

The key informants who were government officials, local and international NGOs and community based organizations stated that most people depend on crop farming due to poverty

in the region since they cannot be able to access financial services such as loans from banks to start business in the county. Also most people in Kitui county lack education and hence formal employment are skills to start a business. Kitui County being an agricultural based rural community, the available options in crop farming are adversely affected by a changing climate; small scale businesses and labor opportunities are the most probable alternative livelihood opportunities to reduce their vulnerability and enhance their resilience, though this is dependent on other socio-economic factors that might reduce on the opportunities that they would like to diversify.

Table 4. 28: Main Source of Household Income in the County

Response	Frequency(n)	Percentage (%)
Crop farming	47	40.9
Business	13	11.3
Pastoralism	21	18.3
Salary	8	7.0
Wages	26	22.6
Total	115	100.0

4.6.2 Type of Housing in the County

From the table 4.29 below on the type of housing of the residents, the study requested the respondents to indicate the type of house they live in, from the findings, it was found that most of the respondents as shown by 48.7% (56) indicated they lived in mud walled grass thatched houses, 40.9% (47) indicated they lived in semi-permanent houses with iron sheets while 10.4% (12) indicated they lived in stone walled- permanent houses. This is an indication that the poverty level was high as only 10.4% of the residents lived in permanent houses. The increased poverty in the region leads to inability to access education and other critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

Table 4. 29: Type of Housing in the County

Response	Frequency(n)	Percentage (%)
Mud walled grass thatched	56	48.7
Stone walled- Permanent	12	10.4
Semi-permanent with iron sheets	47	40.9
Total	115	100.0

4.6.3 Fuel Used For Cooking in the County

Referring to table 4.30 on the type of fuel used for cooking, the study requested the respondents to indicate the type of fuel they use for cooking, from the findings, it was determined that most of the respondents as shown by 68.7% (79) indicated they used firewood, 20% (23) indicated they use charcoal, 7.8% (9) indicated they used kerosene while 3.5% (4) indicated they used gas. This is an indication that the poverty level was high as only 3.5% of the residents used gas as a source of fuel. The high number of residents who used charcoal and firewood also destroyed the environment causing drought and famine. The key informants indicated that they used firewood as a source of fuel since they could not be able to access other sources of fuel such as gas which are eco-friendly. Furthermore those who didn't use firewood used charcoal as a source of fuel. The increased use of firewood as source of fuel has led to environmental degradation leading to drought and hence famine in Kitui County.

Table 4. 30: Fuel Used For Cooking in the County

Response	Frequency(n)	Percentage (%)
Firewood	79	68.7
Charcoal	23	20.0
Kerosene	9	7.8
Gas	4	3.5
Total	115	100.0

4.6.4 Problems When Accessing Water in the County

From table 4.31 on the problems faced when accessing water, it is clear that most of the respondents as shown by 56% (48.7) indicated long distance travelled was a major problem,

35.7% (41) indicated scarcity of water, 11.3% (13) indicated dirty water while 4.3% (5) indicated conflict with neighboring communities. This is an indication that the poverty level was high as most people don't access water easily. The study also found that the rainfall trends in the area have been very unpredictable exposing the area to a persistent droughts leading to famine. The extent and impact of the drought and the experience of famine varied substantially among regions, communities, households, and individuals, with results ranging from death and disability of family members to windfall profits from livestock and food trading.

This low level of water availability has the high chance of increasing incidences of water borne diseases, because people use the water that is available as a life saving measure. Low availability of water makes household's compromise on many issues, resulting in poor hygiene levels since water use is highly prioritized. Other unforeseen challenges arise in communities, such as family, clan, tribal conflicts increase within communities that have traditionally lived peacefully, however as a result of the changing climatic conditions; they are forced to resort to unforeseen means for their livelihood survival.

Table 4. 31: Problems When Accessing Water in the County

Response	Frequency(n)	Percentage (%)
Long distance	56	48.7
Dirty water	13	11.3
Scarcity of water	41	35.7
Conflict with neighboring communities	5	4.3
Total	115	100.0

4.6.5 Means of Transport for Farm Products to the Market in the County

As per the table 4.32 on the means of transport for farm products to the market, the study requested the respondents to indicate the means of transport for their farm products to the market, from the findings, it was established that most of the respondents as shown by 40% (46) used human transport, 20.9% (24) indicated they used Matatu, 16.5% (19) indicated they used donkeys, 12.2% (14) used carts, 7% (8) used buses while 3.5% (4) indicated they used lorries. This is an indication that the poverty level was high as most people used human transport to take their products to the market. The key informants who were government officials, local and

international NGOs and community based organizations indicated that the increased poverty in Kitui county and lack of income due to over dependence in crop farming is the reason for most of the residents left with human transport and Matatus as the main use of transport.

Table 4. 32: Means of Transport for Farm Products to the Market in the County

Response	Frequency(n)	Percentage (%)
Lorry	4	3.5
Bus	8	7.0
Matatu	24	20.9
Cart(Mkokoteni)	14	12.2
Donkey	19	16.5
Human Transport	46	40.0
Total	115	100.0

4.7 Relationship between Drought and Famine and Education Status in the County

4. 7.1 Respondents’ Level of Education in the County

From the table 4.33 on the level of education of the respondents, the study requested the respondents to indicate their level of education, from the findings, it came to the researchers attention that most of the respondents as shown by 33.9% (39) indicated that they had only primary education qualification, 24.3% (28) of the respondents indicated they had only secondary education, 22.6% (26) indicated they had no education at all, 13% (15) had college education qualification whereas 6.1% (7) of the respondents indicated they had university education, this is an indication that respondents were the illiteracy level was high. The key informants who were government officials, local and international NGOs and community based organizations indicated that the high level of illiteracy was the cause of poverty in the region. The lack of enough formal education, as most of the respondents had attained only primary education is a major cause of lack of decisiveness on disaster preparedness and resilience in Kitui County. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience (FAO, 2010).

Table 4. 33: Respondents' Level of Education in the County

Level of Education	Frequency(n)	Percentage (%)
No Education	26	22.6
Primary	39	33.9
Secondary	28	24.3
College	15	13.0
University	7	6.1
Total	115	100.0

4.7.2 Respondents Number of Children in the County

From the table 4.34 on the number of children of the respondents, the study requested the respondents to indicate the number of children, from the findings, it came to the researchers attention that most of the respondents as shown by 58.3% (67) indicated that they had 1-4 children, 30.4% (35) of the respondents indicated they had no children whereas 11.3% (13) of the respondents indicated they above 4 children, this is an indication that most of the respondents had between 1- 4 children. The significant number of respondents with above 4 children could be a major cause of poverty hence increasing disaster in the region. The key informants who were government officials, local and international NGOs and community based organizations indicated large family size is expected to be an enabling factor for farmers to take up labour intensive adaptation strategies. Some noted that large family sizes might be forced to divert part of their labour into other off-farm activities so as to generate extra income. The families that had large number of children were poor and thus could not prepare well for drought and other disasters associated with drought.

Table 4. 34: Respondents Number of Children in the County

Response	Frequency(n)	Percentage (%)
No children	35	30.4
1 to 4 children	67	58.3
Above 4 children	13	11.3
Total	115	100.0

4.7.3 Number of Children in School in the County

From the table 4.35 below on the number of children of the respondents who are enrolled in school, the study requested the respondents to indicate the number of children, from the findings,

it came to the researchers attention that most of the respondents as shown by 67.5% (54) indicated that all children were in school whereas 32.5% (26) of the respondents indicated they had not enrolled all their children in school. The key informants who were government officials, local and international NGOs and community based organizations indicated that the high number of children who were in school was due to the free primary education offered by the government and the subsidized secondary education. Poverty and lack of awareness was a major cause of the high number of children who were not in school. The lack of enough formal education, as most of the respondents had attained only primary education is a major cause of lack of decisiveness on disaster preparedness and resilience in Kitui County. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

Table 4. 35: Number of Children in School in the County

Number of Children in School	Frequency(n)	Percentage (%)
Not all	26	32.5
All	54	67.5
Total	80	100.0

4.7.4 School Going Age Children Not in School in the County

From the table 4.36 below on whether there are school going age children not in school, the study requested the respondents to indicate whether there are school going children not in school, from the findings, it was established that most of the respondents as shown by 77.5% (62) indicated that no school going children who had not been enrolled in school whereas 22.5% (16) of the respondents indicated some of the school going children were not in school. The key informants who were government officials, local and international NGOs and community based organizations indicated that the high number of children who were in school was due to the free primary education offered by the government and the subsidized secondary education. Poverty and lack of awareness was a major cause of the high number of children who were not in school. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

Table 4. 36: School Going Age Children Not in School in the County

Response	Frequency(n)	Percentage(%)
Yes	18	22.5
No	62	77.5
Total	80	100.0

4.7.5 Reason for Failure of the Children to Attend School in the County

As can be seen from table 4.37 below on reason for failure of children to attend school, the study requested the respondents to indicate their reason of failure of children not being in school, from the findings, it is clear that most of the respondents as shown by 36.5% (42) indicated it was due to lack of fees, 21.7 (25) indicated it was due to lack/inadequate school materials. 18.3% (21) indicated that they were working where they helped their parents, 13% (15) indicated marriage was a cause of students failure to attend school while 10.4% (12) indicated that the students generally refused to go to school leading to drop out of the students. The key informants who were government officials, local and international NGOs and community based organizations indicated poverty and lack of awareness was also a major cause of the high number of children who were not in school. The residents also lack a source of income which is important to support their families and send the children in schools. The children are also forced to drop out of school due to hunger as a result of drought. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

Table 4. 37: Reason for Failure of the Children to Attend School in the County

Reason for Failure of Children to go to School	Frequency(n)	Percentage (%)
Lack of fees	42	36.5
Lack of/Inadequate schools materials	25	21.7
Refused to go to school	12	10.4
Married	15	13.0
Working	21	18.3
Total	115	100.0

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents summary of key data findings, conclusion drawn from the findings highlighted and the recommendation made.

5.1 Summary of Findings

5.1.1 Role of government and NGOs in Counteracting Drought and Famine in the County

Most of the respondents represented by 71.3% (82) indicated there were institutions the community has worked with to address climate change while 28.7% (33) indicated there were institutions. This is an indication that the community has worked with institutions to address climate change and reduce drought and famine. The participation of the NGOs and other organizations in the community in addressing climate change means that the community is given resources informs of information and financial services thus the members in the community are able to diversify their activities hence they are in a better position of disaster preparedness and resilience. On the type of institutions/ organizations used to address Climate change, it is clear that most of the respondents represented by 44.3% (51) indicated the institution used was NGO, 37.4% (43) indicated government ministries were used, 13% (15) indicated the private sector was used while 5.2% (6) indicated it was the contribution of the individuals in the community. This is an indication that there are institutions within the community used to address climate change and reduce drought and famine.

The study found that the community has received support from various organizations in coping with drought through various measures such as conducting forum and sensitizing the locals on the need of conserving the environment through planting of trees and eliminating deforestation which is a major cause of drought. Boreholes have been built for the locals to increase the water content for the community. The key informants indicated that in coping with drought the residents have empowered the residents to grow drought resistant crops which can cope under harsh weather conditions. The organizations further strengthen the need for diversification of income generating activities and livelihood strategies for households and communities living in Kitui County, in situations with limited income generating opportunities, it is usually a

vulnerable households limited productive assets' that are at the greatest risk from the negative impacts of drought. On whether there were negotiations and discussions about disaster risk management interventions in the area, it is clear that most of the respondents represented by 70.4% (81) indicated there were some interventions, 29.6% (34) indicated there were no interventions. This is an indication that there are some negotiations and discussions about disaster risk management intervention which helps to reduce drought and famine but there should be more interventions. The key informants indicated that the organizations have requested the residents to diversify their income through engaging in other business generating income activities apart from crop farming. The communities are also advised to save money which would be useful to the households in times of disaster.

On the proposals for disaster risk management interventions, it is clear that most of the respondents represented by 35.7% (41) indicated the proposals came from NGOs, 27% (31) indicated politicians, 16.5% (19) indicated the proposals came from the governments, 11.3% (13) they came from the community, 5.2% (6) while 4.3% (5) indicated they got the proposals from the politicians. This is an indication that most proposals came from NGOs hence other stakeholders should bring proposals for disaster risk management. The key informants indicated that there is need for safety net programs that communities and households are well aware of, and they are able to tap in for assistance.

On whether the clients understand climate change, most of the respondents represented by 62.6% (72) indicated they understood climate change while 37.4% (43) indicated they didn't understand. This is an indication that some of the residents didn't understand climate change hence there is need for education about climate change to reduce disasters and manage them. The key informants indicated most of the residents understand climate change and have inherent abilities and disabilities to deal with climate variability and a changing climate, with adaptive capacities being unevenly distributed across households. However, the most vulnerable households in a community who traditionally are the poor and most at risk, are highly vulnerable to the negative impacts of a changing climate, as a result of the underlying factors that inhibit their capacity to sufficiently cope with the emerging climatic conditions.

5.1.2 Effect of Drought and Famine on Agricultural Production in the County

Most of the respondents represented by 77.4% grew maize, 67.8% indicated they grew beans, 37.4% indicated they grew millet while 32.2 % indicated they grew cassava. This is an indication that the region is dry as these crops thrive in dry regions. The key informants indicated that only drought resistant crops can thrive in Kitui County since the area is prone to drought and has infertile soil. Further most farmers don't engage in cash crops since they don't have enough food for their families. It was also established that most of the respondents represented by 70.4% (81) indicated the land was infertile, 23.5% (27) indicated the land was fertile while 6.1% (7) indicated the land was very fertile. This is an indication that the infertility of the land was high, the reason for the residents being unable to grow sufficient food crops leading to famine. The key informants indicated although most of the land is infertile most farmers in the county practice traditional farming methods, with low use of mechanized farming and application of fertilizer, a factor which results in low output per acreage in comparison to those practicing modern farming approaches. Introduction of inexpensive and easily adaptable risk reduction methods, such as conservation agriculture, would help in food security.

Most of the respondents represented by 61.7% (71) sourced agricultural extension services from the government, 27% (31) indicated NGOs while 11.3% (13) indicated private sector. This is an indication that the government is committed to giving the residents agricultural extension officers/services to end poverty. It was also established that most of the respondents represented by 66.1% (76) faced food shortage while only 33.9% (39) indicated they didn't face food shortage. This is an indication that the poverty level was high as most people faced food shortage and hunger this could be due to drought and infertility of the land. The key informants who were government officials, local and international NGOs and community based organizations indicated access to sufficient food is critical for households to hold together, lack of sufficient food at the household level eventually moves to the community and other higher levels of the society, which eventually leaves majority of the people without enough food to eat. As a consequence, the affected populations eventually resort to negative ways to cope, and this has a negative impact on the livelihoods of a community, as more resources previously not meant for food are redirected to purchase food and leaving other equally important needs unmet.

On the crops produced as surplus for sale, the study requested the respondents to indicate the crops they produced as surplus for sale, from the findings, it is came into the researchers attention that most of the respondents as shown by 40.8% (31) sold maize, 28.9% (22) indicated they sold millet, 19.7% (15) indicated they sold cassava while 10.5% (8) indicated they sold beans. This is an indication that at least people in the region could sell some produce thus with support through irrigation and conservation of the environment the residents could have some income and thus reduce poverty. Food security exists when all people, at all times have physical or economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. With this high percentage of people with no sufficient food, there is no much surplus available for sale. Most of the respondents represented by 62.6% (72) indicated it was due to drought, 23.5% (27) indicated lack of farm inputs, 12.2% (14) indicated shortage of land while 1.7% (2) indicated floods. This is an indication that drought was the main cause of the food shortage hence there should be measures to conserve the environment hence reduce drought and famine. The key informants indicated that drought and famine has been the talk in the last decade in Kitui County where the residents have suffered a lot from the disaster, there has been reduction in food production, which makes the lives of the residents difficult.

Most of the respondents as shown by 51.4% (37) indicated there was decrease in rains and change in timing, 18.1% (13) indicated there were changes in the timing of rains, 15.3% (11) indicated that there were change in frequency of droughts/floods, 12.5% (9) indicated the rainfall had declined, while 2.8% (2) indicated that rainfall had increased. This is an indication that that there was change in climate change due to destruction of the environment hence need for interventions to conserve the environment and reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations found that the decrease in rainfall days over the last 10 years has led to frequent droughts in the county and continue to be one of the key challenges affecting development goals, with water and sanitation sector being among the most affected by drought. During drought, residents with no alternative water sources are forced to get water from alternative sources which are usually further away from the affected households.

5.1.3 How Drought and Famine Influence the Living Standards of the Community

On the main source of household income, the study requested the respondents to indicate the main source of household income, from the findings, it is clear that most of the respondents as represented by 40.9% (47) indicated the main source of income is crop farming, 22.6% (26) indicated the main source was wages, 18.3% (21) indicated pastoralism, 11.3% (21) indicated business while 7% (8) indicated the main source was salary. The key informants who were government officials, local and international NGOs and community based organizations stated that most people depend on crop farming due to poverty in the region since they cannot be able to access financial services such as loans from banks to start business in the county. Also most people in Kitui county lack education and hence formal employment are skills to start a business. Kitui County being an agricultural based rural community, the available options in crop farming are adversely affected by a changing climate; small scale businesses and labor opportunities are the most probable alternative livelihood opportunities to reduce their vulnerability and enhance their resilience, though this is dependent on other socio-economic factors that might reduce on the opportunities that they would like to diversify.

Most of the respondents represented by 48.7% (56) indicated they lived in mud walled grass thatched houses, 40.9% (47) indicated they lived in semi-permanent houses with iron sheets while 10.4% (12) indicated they lived in stone walled- permanent houses. This is an indication that the poverty level was high as only 10.4% of the residents lived in permanent houses. The increased poverty in the region leads to inability to access education and other critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience. It was determined that most of the respondents represented by 68.7% (79) indicated they used firewood, 20% (23) indicated they use charcoal, 7.8% (9) indicated they used kerosene while 3.5% (4) indicated they used gas. This is an indication that the poverty level was high as only 3.5% of the residents used gas as a source of fuel. The high number of residents who used charcoal and firewood also destroyed the environment causing drought and famine. The key informants who were government officials, local and international NGOs and community based organizations indicated that they used firewood as a source of fuel since they could not be able to access other sources of fuel such as gas. Furthermore those who

didn't use firewood used charcoal as a source of fuel. The increased use of firewood as source of fuel has led to environmental degradation leading to drought and hence famine in Kitui County.

On the problems faced when accessing water, it is clear that most of the respondents represented by 56% (48.7) indicated long distance travelled was a major problem, 35.7% (41) indicated scarcity of water, 11.3% (13) indicated dirty water while 4.3% (5) indicated conflict with neighboring communities. This is an indication that the poverty level was high as most people don't access water easily. The study also found that the rainfall trends in the area have been very unpredictable exposing the area to persistent drought leading to famine. The extent and impact of the drought and the experience of famine varied substantially among regions, communities, households, and individuals, with results ranging from death and disability of family members to windfall profits from livestock and food trading. The key informants who were government officials, local and international NGOs and community based organizations indicated that this low level of water availability has the high chance of increasing incidences of water borne diseases, because people use the water that is available as a life saving measure. Low availability of water makes household's compromise on many issues, resulting in poor hygiene levels since water use is highly prioritized. Other unforeseen challenges arise in communities, such as family, clan, tribal conflicts increase within communities that have traditionally lived peacefully, however as a result of the changing climatic conditions; they are forced to resort to unforeseen means for their livelihood survival.

On the means of transport for farm products to the market, the study requested the respondents to indicate the means of transport for their farm products to the market, from the findings, it was established that most of the respondents represented by 40% (46) used human transport, 20.9% (24) indicated they used matatu, 16.5% (19) indicated they used donkeys, 12.2% (14) used carts, 7% (8) used buses while 3.5% (4) indicated they used lorries. This is an indication that the poverty level was high as most people used human transport to take their products to the market. The key informants who were government officials, local and international NGOs and community based organizations indicated that the increased poverty in Kitui county and lack of income due to over dependence in crop farming is the reason for most of the residents left with human transport and matatus as the main use of transport.

5.1.4 Relationship between Drought and Famine and Education Status in the County

On the level of education of the respondents, the study requested the respondents to indicate their level of education, from the findings, it came to the researchers attention that most of the respondents represented by 33.9% (39) indicated that they had only primary education qualification, 24.3% (28) of the respondents indicated they had only secondary education, 22.6% (26) indicated they had no education at all, 13% (15) had college education qualification whereas 6.1% (7) of the respondents indicated they had university education, this is an indication that respondents were the illiteracy level was high. The key informants who were government officials, local and international NGOs and community based organizations indicated that the high level of illiteracy was the cause of poverty in the region. The lack of enough formal education, as most of the respondents had attained only primary education is a major cause of lack of decisiveness on disaster preparedness and resilience in Kitui County.

On the number of children of the respondents, the study requested the respondents to indicate the number of children, from the findings, it came to the researchers attention that most of the respondents represented by 58.3% (67) indicated that they had 1-4 children, 30.4% (35) of the respondents indicated they had no children whereas 11.3% (13) of the respondents indicated they had above 4 children.. The key informants who were government officials, local and international NGOs and community based organizations indicated large family size is expected to be an enabling factor for farmers to take up labour intensive adaptation strategies. Some noted that large family sizes might be forced to divert part of their labour into other off-farm activities so as to generate extra income. The families that had large number of children were poor and thus could not prepare well for drought and other disasters associated with drought.

On the number of children the respondents had enrolled in school, the study requested the respondents to indicate the number of children, from the findings, it came to the researchers attention that most of the respondents represented by 67.5% (54) indicated that all children were in school whereas 32.5% (26) of the respondents indicated they had not enrolled all their children in school. The key respondents indicated that the high number of children who were in school was due to the free primary education offered by the government and the subsidized secondary education. Poverty and lack of awareness was a major cause of the high number of children who

were not in school. The key informants who were government officials, local and international NGOs and community based organizations indicated lack of enough formal education, as most of the respondents had attained only primary education is a major cause of lack of decisiveness on disaster preparedness and resilience in Kitui County. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

On whether there were school going age children not in school, the study requested the respondents to indicate whether there were school going children not in school, from the findings, it was established that most of the respondents represented by 77.5% (62) indicated that school going children had been enrolled in school whereas 22.5% (16) of the respondents indicated some of the school going children were not in school. The key informants who were government officials, local and international NGOs and community based organizations indicated that the high number of children who were in school was due to the free primary education offered by the government and the subsidized secondary education. Poverty and lack of awareness was a major cause of the high number of children who were not in school. Good access to education makes one able to access critical services such as credit, technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

On reason for failure of children to attend school, the study requested the respondents to indicate their reason of failure of children not being in school, from the findings, it is clear that most of the respondents represented by 36.5% (42) indicated it was due to lack of fees, 21.7 (25) indicated it was due to lack/inadequate school materials. 18.3% (21) indicated that they were working where they helped their parents, 13% (15) indicated marriage was a cause of students failure to attend school while 10.4% (12) indicated that the students generally refused to go to school leading to drop out of the students. The key informants who were government officials, local and international NGOs and community based organizations indicated poverty and lack of awareness was also a major cause of the high number of children who were not in school. The residents also lack a source of income which is important to support their families and send the children in schools. The children are also forced to drop out of school due to hunger as a result of drought. Good access to education makes one able to access critical services such as credit,

technology and input supply which will enable them make good decisions on disaster preparedness and resilience.

5.1.5 Control Measures Adopted To Help In Curbing Drought and Famine

The study found that most of the respondents represented by 63.5% (73) indicated they beg food relief from government, 23.5% (27) indicated they begged assistance from relatives, friends or neighbours, while 13% (15) indicated they bought food. This is an indication that most residents begged food in times of shortage hence there should be measures to conserve the environment hence reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations also indicated that in times of food shortage there is creation of awareness and distribution of food in the region which is done mostly by the government.

On the contribution of the community towards intervention, it was clear that most of the respondents represented by 36.5% (42) indicated they contributed labour, 27% (31) indicated they contributed information, 17.4% (20) contributed materials, 10.4% (12) contributed training, 6.1% (7) contributed funds while 2.6% (3) had nothing to contribute. This is an indication that most residents had something to contribute towards the interventions to conserve the environment hence reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations indicated that the community provided labour and information which is done mostly through disaster management committee formed under supervision of the government.

On the adjustments in farming practices to climate variability and change, it was clear that most of the respondents represented by 59.1% (68) indicated there were adjustments in farming practices to climate variability and change while 40.9% (47) indicated that there were no adjustments in farming practices to climate variability and change. This is an indication that there is need for adjustments in farming practices to climate variability and change to reduce drought and famine. The key informants who were government officials, local and international NGOs and community based organizations indicated that some community members have resulted to growing drought resistant crops such as sorghum and millet.

On the adjustments made in farming practices to long-term shifts in temperature and rainfall, it is clear that most of the respondents represented by 77.4% (89) indicated there was irrigation, 67.8% (78) indicated there was change in crop variety, 53% (61) indicated that there was diversification of crop types and varieties, 41.7% (48) indicated there were changes in size of land under cultivation, 40.9% (47) indicated there were diversification of livestock types and varieties, 33% (38) they built water harvesting schemes, 31.3% (36) indicated there were changes in planting dates, 29.6% (34) indicated they implemented soil conservation schemes, 23.5% (27) indicated they diversified from farming to non-farming activity while 20% (23) indicated that they had reduced number of livestock. This is an indication that that there were changes in adjustments made in farming practices to long-term shifts in temperature and rainfall to reduce drought and famine.

The key informants who were government officials, local and international NGOs and community based organizations further indicated that with the changing climate and inherent risks associated with rain fed agriculture, the percentage found in the study show an equal number of households are embracing the use of drought resistant agricultural practices as those who still use the regular farming practices. With the cyclic droughts being experienced in the County, poor performance of rainy seasons, multiple re-planting routines, drought resistant agriculture farming practice would be an appropriate risk reduction initiative that would help reduce the high risks of food insecurity; as was found in the study on the number of people who are food insecure during droughts. The key informants further stated that any adaptation efforts in farming practices that can reduce community vulnerability to succeed, it will require there to be changes in agricultural processes, changes in existing social practices and environmental processes, changes in the perceptions of the community towards the inherent risks resulting from a changing climate, changes to the community cultural and traditional practices and activities that ultimately reduce potential damages or provide communities with diverse methods of farming such as irrigation, crop rotation etc.

On the main constraints to adaptation measures, it was clear that most of the respondents represented by 50.4% (58) indicated lack of access to water, 28.7% (33) indicated lack of capital, 28.7% (33) indicated that lack of capital was a major constraint, 14.8% (17) indicated lack of

information, 4.3% (5) indicated shortage of labour while 1.7% (2) indicated poor health. This is an indication that lack of access to water was a major concern to adaptive measures hence need for interventions to conserve the environment and reduce drought and famine. The government can also build borehole to facilitate irrigation. From the results the key informants who were government officials, local and international NGOs and community based organizations stated that, capital and lack of access to water inhibit adaptive measures. Most of the households in the County have an appreciation on the need for monetary savings as an alternative backup, which could come in handy during crisis times especially drought. Also the community way of livelihood acted as a hindrance to effective water conservation as they do not pay attention to water demanding activities. Much of the water present is directed to livestock management and household needs which do not give the morale for water conservation. During drought seasons, the communities rely greatly on the government for survival and many deaths occur due to this reason as they have only one way of livelihood.

5.2 Conclusion

The study found that most of the respondents lacked formal education and were married. The study also concludes that most household heads in Kitui County depend on crop farming as a source of income. The study also concludes that drought was the main cause of food shortage in the county. The study concludes that there were changes in adjustments made in farming practices to long-term shifts in temperature and rainfall to reduce drought and famine. The study also concludes that lack of access to water was a major concern to adaptive measures hence the need for interventions to conserve the environment and reduce drought and famine. The government can also build more boreholes and dams to facilitate irrigation.

The study concludes that failure to involve all stakeholders in responding to drought has been a major challenge. Community participation in drought disaster risk management has also been ignored and emphasis has been on emergency relief and response. The affected communities have also become too weak when drought strikes and unilateral declaration by project administration without listening to people's responses which would involve communities has also been a challenge.

The study also concludes that the community has worked with various institutions to address climate change and reduce drought and famine. The study also concludes that the organizations have supported the community in coping with drought through various measures such as conducting forums and sensitizing the locals on the need of conserving the environment through planting of trees and eliminating deforestation which is a major cause of drought. The organizations have also built boreholes and dams for the locals to increase the water content for the community. In coping with drought the residents have been empowered to grow drought resistant crops which can cope under harsh weather conditions. The institutions have also requested the residents to diversify their income through engaging in other income generating activities.

5.3 Recommendations

The farmers in Kitui County should be encouraged to diversify their income generating activities since high dependency in crop farming leads to losses and increased poverty in times of drought as majority of the residents have no other source of income for their livelihood.

The farmers should be encouraged to grow drought resistance crops such as sorghum and millet which are not prone to drought and this will reduce famine in the region.

The government and both the local and international NGOs should put in place various measures to mitigate drought in the region by enhancing opportunities for small scale irrigation, water harvesting and the construction of more boreholes and dams in the region.

The community should be educated on the importance of trees to the environment. The community should be discouraged from cutting down trees for firewood and given other options like biogas production or solar power generation

The government should encourage parents on the importance of education. Education will provide opportunities in the future for their children. Parents can enroll in adult education programs that are available in the county.

The government should promote the formation of local rural institutions and farmer groups. This will help in educating farmers on fertilizers, seed varieties, crop diversification and also livelihood diversification and the development of community drought early warning systems.

5.4 Further Research

Research can be done to improve agricultural production in the County such as planting drought resistant seed varieties. For example; Drought tolerant maize varieties are higher yielding when drought strikes. They have in-built tolerance mechanisms to water shortage and continue producing more than other maize varieties.

Research can be done to improve agricultural production in the county by introducing small scale irrigation. For example; In Zambia, it is found that rural farmers in drought prone areas, were able to cultivate vegetables in the dry season and earned 35% more than those who do not. The systems used for small-scale irrigation, such as pumps and on-farm ponds, are relatively cheap, and being freed from rain dependence can allow farmers to grow crops year-round, and to grow more high-value crops.

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APPENDIX A: HOUSEHOLD QUESTIONNAIRE

QUESTIONNAIRE
Serial Number

Household Number	
Location/Sub-Location/District	

		Enter Code
1. Gender of the respondents	01=Male 02= Female	
2. How old are you?	01= 10-19 years 06= 60-69years 02= 20-29 years 07= 70-79years 03= 30-39 years 08= 80+ 04= 40-49years 99=Don't Know 05= 50-59years	
3. How Long Have you lived in this community?	01=Below one year 03= 6-10 years 02= 1-5 years 04= 11+ years	
4. What is your marital status?	01 = Single 02 = Married 03 = Divorced/Separated 04 = Widow/ Widower 98 = No answer 99 = Don't know	
5. What is your highest level of education?	01=Primary 04=University 02=Secondary 05=None 03=College 97=Others(Specify)	
6. How many children do you have?	01=None	

	02=1-4 03=5+	
7. How many of the above children are in school?	01=None 02=All 03=Specify No.	
8. Are there any of your children who are of school going age, currently not attending school?	01=Yes 02=No	
9. If YES above, what are the reasons that they are not attending school?	01=Lack of fees 02=Lack of/Inadequate schools 03=Refused to go to school 04=Married 05=working 97=Others	
10. What is your main source of income?	01=Crop farming 05=Wages 02=Business 06=None 03=Pastoralism 97=Others(Specify) 04=Salary	
11. What type of housing do you have?	01=Mud walled grass thatched 02= Stone walled- Permanent 03=Semi-permanent with iron sheets 97=Others(Specify)	
12. What is your main fuel for cooking in your household?	01=Firewood 03=Kerosene 97=Others(Specify)	

	02=Charcoal 04=Gas	
13. What problems do you experience in accessing water?	01=Long distance 02=Dirty water 03=Scarcity of water 04=Conflict with neighboring communities	
14. What food crops do you grow?	01=Maize 04=Cassava 02=Beans 97=Others(Specify) 03=Millet	
15. Is your land fertile?	01=Very fertile 02=Fertile 03=Infertile 98=Don't know	
16. What is the main means of transport for farm products to the market?	01=Lorry 04=Cart(Mkokoteni) 02=Bus 05=Donkey 03=Matatu 97=Others(Specify)	
17. What are the sources of agricultural extension officers/services?	01=Government 99=None 02=Private 98=Others(Specify) 03=NGO	
18. Does the household experience food shortages of main food items?	01=Yes 02=No	
19. If NO, what crops do you sometimes produce as surplus for sale?	01=Maize 04=Cassava 02=Beans 97=Others(Specify) 03=Millet	

20. If YES, what are the reasons for food shortages?	01=Drought 02=Floods 03=Lack of farm inputs 04=Land 97=Others(Specify)	
21. If YES, how do you cope with food shortage?	01 = Buy food 02 = Beg assistance from relatives, friends or neighbours. 03 = Beg food relief from government. 97 = Others(Specify)	
22. Have you ever been involved in negotiations and discussions about Disaster risk management interventions in this area?	01=Yes 02=No 98=No answer 99=Don't know	
23. For Disaster risk management interventions to come in this area, who proposes them?	01=Community 05=Elders 02=Chief 06=Politicians 03=Government 99=Don't Know 04=NGO	
24. What did the community contribute towards the interventions?	01=Labour 02=Funds 03=Trainings 04=Materials 05=Nothing 06=Information	

25. Do you understand what climate change is?	01=Yes 02=No	
26. If yes, what has happened to the number of rainfall days over the last 10 years?	01 = Increased 02 = Declined 03 = Change in the timing of rains 04 =Decrease in rains and change in timing 05 =Change in frequency of droughts/floods	
27. Have you made any adjustment in your farming practices to climate variability and change?	01=Yes 02=No	
28. What adjustments have you made in your farming practices to these long-term shifts in temperature and rainfall? Tick the adjustments made. (Multiple responses allowed)	01 = Change crop variety 02 = Build water harvesting schemes 03 = Implement soil conservation schemes 04 = Diversification of crop types and varieties 05 = Diversification of livestock types and varieties 06 = Changing planting dates 07 = Changing size of land under cultivation 08 = Irrigation 09 = Reduce number of livestock 10 = Diversify from farming to non-farming activity	
29. List the main constraints to adaptation measures	01 = Lack of capital 02 = Lack of information 03 = Shortage of labour 04 = Lack of access to water 05 = Poor health	

	97 = Others	
30. Are there institutions/organizations your community has worked with to address the effects of climate change on livelihood?	01 = Yes 02 = No	
31. If, yes please indicate what type of institutions/organizations they were?	01 = NGOs 02 = Government ministry 03 = Private sector 04 =An individual 97 = Others (specify) 99 = Don't know	
THE END	THANK YOU	

APPENDIX B: KEY INFORMANT GUIDE

The guiding questions are designed to capture contextual constraints, the most significant drivers of change, organizational successes and challenges, and general recommendations.

Each participant will be asked the following questions:

1. Tell us about your organization and what you're doing in Kitui?
2. Please provide an overview of the drought situation in Kitui over the last 5 years?
3. What has been the most significant impact of drought on agricultural production, living standards and educational status of the people of Kitui County?
4. How has your organization helped the community in coping with drought?
5. What have been the challenges and successes during the current response?
6. Do you have any recommendations?

APPENDIX C: INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSION

- 1) What is your understanding of drought and famine?
- 2) How often has drought occurred in the past? Say in the last 10 years.
- 3) What are the impacts of drought on the community's health, food security, livestock, education, purchasing power, agricultural production:
- 4) How did the community of this area cope with drought in the past?
- 5) How did the community of this area cope with the recent drought?
- 6) What other livelihood options do people have in the event of severe drought?
- 7) How do you get information about an impending drought?
- 8) How do you prepare after getting such information?
- 9) What has the government done to help reduce the impacts of drought?
- 10) Is the government response helpful?