COMMUNITY BASED DISASTER RISK REDUCTION IN ENHANCEMENT OF HOUSEHOLD LIVELIHOOD SECURITY IN LAIKIPIA NORTH DISTRICT, LAIKIPIA COUNTY, KENYA.

By

ANTHONY KIHURO MWANGI

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DECLARATION

I declare that this is my original work and it has not been presented for the award of any degree or any other award in this university or any other institution of higher learning for examination.

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Anthony Kihuro Mwangi Date

Reg. No: L50/74546/2012

This project report has been submitted for examination with my approval as the university supervisor.

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Dr. Lillian Otieno-Omutoko Date

Senior Lecturer, Department of Extra Mural Studies,

School of Continuing and Distance Education

University of Nairobi

DEDICATION

This research report is dedicated to my dear parents, son and siblings who gave me strength all through.

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ABBREVIATIONS AND ACRONYMS

ALRMP -	Arid Lands Resource Management Project
ASAL	Arid and Semi Arid Lands
CBNRM	Community Based Natural Resource Management
CBO	Community Based Organization
CMDRR	Community Managed Disaster Risk Reduction
DC	District Commissioner
DMO	Drought Management Officer (of ALRMP)
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
DRRAP	Drought Risk Reduction Action Plan
EP&R	Emergency Preparedness & Response
EU	European Union
EWS	Early Warning Systems
EWT	Emergency Water Trucking (Tinkering)
FAO	Food and Agriculture Organization of the United Nations
GoK	Government of Kenya
IGAs	Income Generating Activities
MDGs	Millennium Development Goals
MoLD	Ministry of Livestock Development
MoWI	Ministry of Water and Irrigation
NEMA	National Environmental Management Authority
NGOs	Non-Governmental Organizations
NRM	National Resources Management
PISP	Pastoralist Integrated Support Programme
PRSP	Poverty Reduction Strategy Paper
RDD	Regional Drought Decision Programme of ECHO

RATs	Rapid Assessment Teams
RRTs	Rapid Response Teams (for borehole maintenance and repair)
ToR	Terms of Reference
WFP	World Food Programme
UN	United Nations

ABSTRACT

Disaster risk reduction (DRR) is a systematic approach to identifying, assessing and reducing the risks of disaster. It aims to reduce socio-economic vulnerabilities to disaster as well as dealing with the environmental and other hazards that trigger them. DRR is a priority because it empowers the community with sustainable skills and knowledge to overcome disaster risks which in turn helps them overcome poverty and suffering which otherwise not undertaken the impact of disasters on people's livelihoods would not be tackled. Unless one considers how disaster risk reduction can reduce communities' vulnerabilities to disasters, the work to strengthen livelihoods could be seriously undermined or worse, actively contribute to increased vulnerability in the future. Many disaster-affected communities suffer chronic and transient food insecurity, which becomes acute food insecurity during disasters. A lack of food or not being able to afford or access food is one of the major impacts of disasters. Long-term livelihoods development work can be undermined by disasters, due to loss of assets, increased debts, and greater dependence on risky and unsustainable income-generating activities. The researcher in this study therefore set out to establish how Community Disaster Risk Reduction influenced household livelihood security in Laikipia North district. The objectives of this study were to establish how disaster risks reduction, mitigation, preparedness, response and recovery influenced livelihoods of households in Laikipia North District. By reducing the disaster risk, households were able to improve their lifestyles since they had access to food and water; their health becomes stable since disasters affect human and animal health. Reducing disaster risk also helped households save cash for the future which would have otherwise been used to replace what has been destroyed by disasters. In research methodology, descriptive research design was used to look at the variables being studied. Data was collected by use of questionnaires, which were administered in the field to the sampled respondents. The researcher will applied both probabilistic and non probabilistic methods of sampling. Data was analyzed by use of descriptive statistics which enabled the researcher meaningfully describe a distribution of scores or measurements using a few statistics. Findings were then presented in tables and figures and then interpreted. The study revealed that drought disaster affects the livelihood of communities in various aspects and these effects do contribute to deterioration of household's livelihood security.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The world is regularly shaken by disasters, which are steadily increasing in both intensity and frequency. They are associated with the degradation of the environment and uncontrolled urbanization, two factors that are closely linked to a third factor: rapid population growth. The challenge of achieving sustainable development lies in reducing the impact of disasters on the results of development, by promoting development processes that contribute to reducing disaster risks. Drastic measures are required to bring about a significant reduction in the effects of disasters, which plunge countless communities into situations of greater insecurity and persistent vulnerability to disaster. A close link exists between livelihood security and disaster risk reduction, because disasters exert considerable pressure on livelihoods and development.

Globally, average annual losses caused by disasters associated with natural hazards rose from US$ 75.5 thousand million in the 1960s, to US$ 213.9 thousand million in the 1980s and to US$ 659.9 thousand million in the 1990s. Between 1980 and 2000, disasters claimed over 1.5 million human lives. In 2000, the insurance industry received claims for some 850 disasters, which cost companies about US$ 80 thousand million. The impact of disasters on the poor is much greater, because, unlike people in wealthier countries, they risk losing their entire livelihood and have no insurance cover. Worse still, they risk losing their lives, because of either the disaster itself or the ensuing economic hardship. Communities, especially those that are already battling with a host of development problems and have a limited capacity to undertake reconstruction, risk sinking further into poverty (World Disasters Report, 2002).

In a disaster-prone country like India, disaster management requires that it not only relies on its own experience and knowledge of disasters, but also incorporates the information, experiences and technical know-how that it can obtain from other countries in order to formulate an effective disaster management strategy with a vision of future needs and new progresses in this field. (Global Forum for Disaster Reduction, 2013)

In the African context, the Africa Regional Strategy for Disaster Risk Reduction was adopted in 2004 by the African Union. Its Plan of implementation complements this global framework for action. Following the adoption of this regional strategy, efforts have focused on the adoption of sub regional strategies for disaster risk reduction. This constitutes an important step forward in the risk reduction process. Africa, like other continents, not only faces the

problem of poverty, which makes people vulnerable, and is therefore a major risk factor, but also other problems, including; weak economic growth; income inequality; fragile agricultural economies largely dependent on natural resources; and demographic and social factors, such as high population growth, rapid urbanization and the rural exodus. These factors, added to the effects of globalization and climate change, undermine the coping mechanisms of the poor and increase their vulnerability. In Africa, disaster risk reduction should be an integral part of development programmes, particularly poverty reduction programmes. Some countries such as Senegal have been successful in including disaster risk reduction in their poverty reduction strategy paper, although, unfortunately, they are still in a minority at present. It is widely acknowledged in Africa that the concept of disaster risk reduction can only be effective, and disaster risk reduction strategies and development initiatives successful, if communities become fully involved as actors in decision-making, planning and implementation processes. (African Union, 2004)

In Kenya Eighty percent of Kenya's territory is arid and semi-arid land (ASALs). About 20 percent of Kenya's population (3 million people) lives in these ASALs. Over the last 35 years, at least nine severe droughts have taken place in Kenya, affecting an increasing number of people. The 1975 drought affected 16,000 people, while the droughts of 1999/2001 and 2004/2006 affected 4.4 and 3.5 million people respectively throughout Kenya, (Draft National Policy for Disaster Management 2010). The government of Kenya, in recognition of the need to minimize disaster impacts has embarked fully on disaster management strategies aimed at risk reduction in support of sustainable development objectives. In this context, the government has put in place legal, institutional and administrative measures aimed at strengthening capacity and strategies to be taken before, during and after disasters. The policies and institutional mechanism the government has developed include; development of national disaster policy, establishment of national disaster reduction platforms, strengthening institutions tackling disaster risk reduction (DRR) related tasks and developing hazard maps. Increasing stakeholder awareness on natural hazards in Kenya is critical to developing programs and projects that are resilient to disaster impacts in support of sustainable development. (Government of Kenya, 2010)

In Laikipia County, disasters are mostly in forms of draughts and famine and have always occurred at four to five year intervals (Laikipia District National Draught Management Authority, 2009). In recent decades, they have happened more frequently and are more intensive. This study mainly focused on drought, which is the most common form of disaster

among the arid and semi arid areas inhabited by the pastoralists. The role of livestock in livelihood strategies is that the rural poor in Laikipia North mainly rely on livestock to improve diets and food security, earn cash for basic requirements or investments, or accumulate animals as savings for emergencies or as a symbol of wealth. Livestock rearing may be a sole activity or part of a diversified farming system. Since droughts are common in ASALs, pastoralists have developed coping mechanisms to deal with them. It is widely acknowledged by disaster managers and researchers that the traditional coping capacity of pastoralists can be sufficient to overcome individual years of drought, as the period between droughts gives them time to recover .Migration between grazing lands to another traditionally the most important coping strategy is becoming more and more limited. These developments are pushing the pastoralists into a downward cycle in terms of livelihood security. In the past, large-scale food distribution programmes have been launched during drought periods to save lives and avert catastrophe. While these interventions meet their aims, the reverse side is that they create donor dependency among pastoralists, eroding their coping capacity and mechanisms and stimulates them to become sedentary even in normal situations. (Ministry of National Planning and Vision 2030, 2009)

1.2 Problem Statement

Disaster loss is on the rise with grave consequences for the survival, dignity and livelihood of households particularly the poor and hard-won development gains. Disaster risk is increasingly of global concern and its impact and actions in one region can have an impact on risks in another, and vice versa. Household livelihood insecurity is one of the more urgent problems faced by society at the beginning of the 21st century. According to World Bank data, 2.7 billion people, nearly 40% of the world's population, live on less than two US dollars a day. Since the end of the 1990s household insecurity has become a major issue for most international and government development agencies and the subject of an increasing number of policy documents and programming initiatives. Disasters have increased over the last 40 years with ever growing negative impacts on humans and their livelihoods. Particularly fast growth in economic losses has been associated with hydro-meteorological events, especially over the last ten to fifteen years. On-going climate change is seen to have contributed to increases in the recent past, whilst even greater losses are to be expected as climate change and extremes increase in the future. Evidence exists that both small scale events and larger, more temporally and spatially dispersed disasters, contribute significantly to household livelihood insecurity. Household livelihood insecurity is seen to contribute to

the growth in disaster risk conditions, especially where it leads to environmental degradation, occupation of unsafe sites, the use of inadequate building techniques and the development of environmentally inadequate or non resilient livelihood options. Moreover, being insecure often means marginalisation or exclusion from social protection mechanisms and risk reduction instruments.

Disaster Risk Reduction (DRR) strategies, enacted at the community level have been strongly favoured and increasingly promoted over the last twenty years, taking up on, and developing ideas and notions. (Maskrey, 1988). Over the last two decades there has been increasing demands to relate such local and community schemes to development and poverty alleviation goals and objectives. Despite what appears to be a clear relationship between DRR and household livelihood security, very little comprehensive analysis has been undertaken to examine the relationship, or non relationship, as well as the strategies, conditions, and factors that support or work against it. This study provides analysis of some of the aspects of the disaster - household livelihood security links and the role community based disaster risk reduction does play in this

1.3 Purpose of the Study

The purpose of this study was to investigate the role of community based disaster risk reduction plays in enhancing household livelihood security in Laikipia North district.

1.4 Research Objectives

The objectives of the research was,

1. To assess how disaster mitigation influences household livelihood security in Laikipia North District, Laikipia County, Kenya
2. To assess how Disaster risk preparedness influences household livelihood security in Laikipia North District, Laikipia County, Kenya.
3. To establish how Disaster response influences household livelihood security in Laikipia North District, Laikipia County, Kenya.
4. To establish how disaster recovery influences household livelihood security in Laikipia North District, Laikipia County, Kenya.

1.5 Research Questions

1. How does disaster mitigation influence household livelihood security in Laikipia North District, Laikipia County, Kenya?

2. How does Disaster risk preparedness influence household livelihood security in Laikipia North District, Laikipia County, Kenya?

3. How does Disaster response influence the household livelihood security in Laikipia North District, Laikipia County, Kenya?

4. How does disaster recovery influence household livelihood security in Laikipia North District, Laikipia County, Kenya?

1.6 Significance of the Study

The study is expected to bring out the importance of community based disaster risk reduction in the enhancement of household livelihood security among pastoralist. This is to prompt the communities be involved in activities which lead to adoption disaster risk reduction strategies hence improving the households livelihood security.

1.7 Limitations of the Study

During the course of the study, language barrier hindered effective data collection. Illiteracy levels were very high in the district and the national languages (English and Kiswahili) were not fully effective in information exchange with the community hence the research involved literate research assistants from the Maasai community who assisted in translation and for data collection where language was a barrier. The provincial administration was also involved in enlightening the community and respondents on the objectives of the study. The culture and beliefs of the community also proved to hinder the information being given. This was be addressed by informing the respondents of the research objectives.

1.8 Delimitations of the study

The area of the study covered an area of 2600.2 sq km. The district is vast and sparsely populated with a population of 13 persons per sq km and lies to the leeward side of Mt. Kenya.

1.9 Assumptions of the study

This study assumed that the variables would remain constant during the whole period of the study. It also assumed that the respondents would give accurate information and all the information would therefore be reliable. The study also assumed that most of the questionnaires if not all would be returned duly filled.

1.10 Definition of significant Terms

Disaster – A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts that exceed the ability of the affected community or society to cope using its own resources.

Disaster Mitigation Lessening or limiting of the adverse impacts of hazards and related disasters.

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

Disaster Prevention Outright avoidance of adverse impacts of hazards and its related disasters.

Disaster risk reduction The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, reduced vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Disaster Resilience The ability of a system, community or society exposed to hazards to resist, absorb, adapt 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; the positive side of vulnerability.

Early warning system; The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

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.

Public awareness The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken, individually and collectively, to reduce exposure and vulnerability to hazards.

Risk The probability of an event and its negative consequences.

Vulnerability The characteristic and circumstances of a community, system or asset to be susceptible to the damaging effects of hazards.

1.11 Organization of the Study

The study was organized into sections and chapters. Chapter one of the study contains the introduction and background of the study. It also includes the statement of the problem the significance research objectives and questions the study tries to answer. The limitations and delimitations of the study are also addressed. Chapter two covers the literature review related to the area of the study while chapter three covers the methodology the study applied to attain the results. In chapter four data analysis, presentations and interpretation was covered while chapter five covers the summary of findings, discussions, conclusions and recommendations of the study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter covers the following areas; history of disaster risk reduction, definition of disaster risk reduction disaster preparedness, disaster mitigation, community disaster response, and disaster recovery. The chapter ends with identifying the gaps in the reviewed literature that prompted this study. This study was guided by the drought cycle management model theoretical framework.

2.2. Theoretical framework

The Drought Cycle Management model (DCM model) is a practical refinement of the more general disaster risk theories. Drought Cycle Management attempts to reduce communities' vulnerability to drought, in order to strengthen their livelihoods rather that merely responding to disasters after they occur. The DCM model stresses the need for a continuum between developments, relief and rehabilitation activities in Arid and semi arid areas (ASALs). The model recognizes four stages in the drought cycle as depicted in the figure above. (Blaikie, Davis, & Wisner, 2007)

The normal stage is a period in which sufficient rain falls. During this stage mitigation activities, such as community development, contingency planning, capacity building and infrastructural development, take place. These mitigation measures are important in that they help the community make prior arrangements. The second stage is the alert and alarm stage. This is stage when the first signs of a forthcoming drought become visible. During this period, activities will be focused on preparing for the drought. These might include building up food strategic stocks, water conservation measures, preparing human health and veterinary services and supplementary feeding of livestock. In the relief stage the drought is at its peak causing food and water shortages and resulting in hunger and possibly deaths among people and livestock. Emergency relief is delivered in order to save lives. Finally, after the emergency, the recovery stage involves reconstruction. Typical measures include the restocking of herds, rehabilitation of dams, capacity building, infrastructural development and natural resource management interventions. (CORDAID, 2004)

2.3 Development of Disaster Risk Reduction

In I970, resolution 2717 for assistance in cases of natural disaster was passed. It invited the Secretary-General to submit recommendations particularly on pre-disaster planning at the

national and international levels. This included the definition of machinery and contingency arrangements capable of coping immediately with disaster situations. Also included was the application of technology to, and scientific research for, the prevention and control of natural disasters. This was also a mitigation of the effects of such disasters, including arrangements to disseminate effectively to all countries the fruits of research from satellites and other sophisticated technology with a view to strengthen international co-operation to determine the causes and early manifestation of impending disasters and the development and improvement of early warning systems. In 1971, resolution 2816, United Nations Disaster Relief Office (UNDRO) was created. The General Assembly (GA) called upon the Secretary-General to appoint a Disaster Relief Coordinator, who would be authorized, on his behalf to promote the study, prevention, control and prediction of natural disasters, to assist in providing advice to Governments on pre-disaster planning. It invited governments to improve on national disaster warning systems. In 1972 resolution 2959, The General Assembly reaffirmed the vital importance, in order to lessen the impact of disasters, of assistance to disaster-prone countries in preventive measures, disaster contingency planning and preparedness. In 1974, Resolution 3345 of strengthening of the United Nations Disaster Relief Office was held and convinced that disaster prevention and pre-disaster planning form an integral part of the international development policy of governments and international organizations. The GA requested the Secretary-General to continue investigating the feasibility of measures of strengthening the UN machinery with regard to disaster prevention and pre-disaster planning. (U.N General Assembly, 2003)

The World Conference on disaster reduction was held at Yokohama, Japan from 23rd to 27 May 1994. Res. 49/22 and endorsed the Yokohama Strategy and its Plan of Action adopted at the World Conference. The Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action (Yokohama Strategy) was adopted in 1994. It provided landmark guidance on reducing disaster risk and the impacts of disasters. The review of progress made in implementing the Yokohama Strategy identified major challenges for the coming years to ensuring a more systematic action in the context of sustainable development and in building resilience through enhanced national and local capabilities to address, manage and reduce risk. The review stressed the importance of disaster risk reduction being underpinned by a more pro-active approach to informing, motivating and involving people in all aspects of disaster risk reduction in their own local communities. It also highlighted the scarcity of either resources allocated

specifically from development budgets for the realization of risk reduction objectives, at the national or the regional level or through international cooperation and financial mechanisms, while noting the significant potential to better exploitation of existing resources and established practices for more effective disaster risk reduction.

The World Conference on Disaster Reduction was held from 18 to 22 January 2005 in Kobe, Hyogo, Japan. It adopted the present Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (here after referred to as the "Framework for Action"). The Conference provided a unique opportunity to promote a strategic and systematic approach to reducing vulnerabilities and risks to hazards. It underscored the need for, and identified ways of, building the resilience of nations and communities to disasters. The rising cost of disasters in both developed and emerging countries has moved disasters risk management to centre stage in the battle against poverty. 168 nations including Kenya have signed the ISDR sponsored, Hyogo Framework for Action. (UNISDR, 2009)

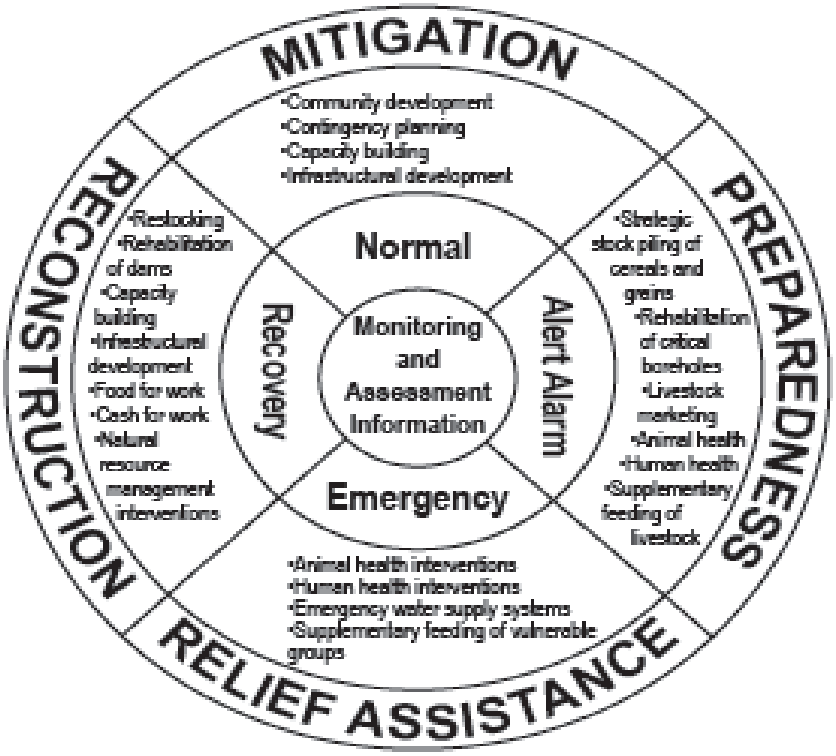

Figure 2.1.Drought Management Cycle Model

Sourced from (Blaikie, Davis, & Wisner, 2007)

The figure above explains and demonstrates the activities involved in each stage of the disaster risk management process. The first stage is the mitigation and is the normal environment. During this stage, disasters is inhibited through community development, contigency planning, capacity building and infrastructural development. The second stage is disaster preparedness and it's the alert or alarm stage where signs of drought can be seen. Here, strategic stockpiling of cereals and grains, rehabilitating key boreholes, livestock marketing, animal and human health interventions and suplementary feeding of livestock should be put in place inorder to be prepared when the disasters strike. The relief period is the period the disaster strikes or the emergerncy period.during this stage, the community is assissted with animal health interventions like vaccination, human health interventions for nutritional related diseases, emergency water supply systems and supplementary feeding of vulnerable groups to reduce the amount of damage or loss that could be brought about by the drought disasters. The last stage is reconstruction stage where the community recovers from the disaster. To recover and help the community stand back to its feet, some programmes like restocking, rehabilitation of water resources damaged by the disasters,capacity development, cash for work programmes , infrastructural development and natural resouces management.This will help the community have some ressilience in times of future disasters.

2.3.1. Disaster impact on communities and livelihoods

The role of natural hazards in shaping the multiple and changing risks to communities and livelihoods is as difficult to isolate as their macroeconomic impacts, perhaps more so given the wide diversity of livelihoods in most countries and their social and environmental determinants. Disasters affect household members differently, often affecting children and the elderly most. In Zimbabwe, children aged 12–24 months lost an average of 1.5–2.0 centimeters of linear growth in the aftermath of the 1994-1995 droughts. The impact was the most severe among the poorest households with few livestock. Female-headed households also tend to fare worse than male-headed ones following a disaster, in part because they have a smaller average resource base. (CORDAID, 2004)

Liquidation of productive assets such as livestock is a coping strategy of dealing with food deficits during droughts which is regarded as a severe household disaster risk. Previous studies indicate that households wealth reduce the likelihood of disaster risk. To avoid this, the Drought Cycle Management model promotes sustainable livestock management, income diversification and water conservation measures. These measures have significant effects;

decrease the negative effects on household disaster risk. Food consumption adjustments typically take place when households have no options to borrow money to cover food shortages, have no or little own land and do not migrate outside the pastoral areas. However, this coping mechanism is negatively correlated with households taking former demanded water conservation measures. This means that taking food consumption adjustment as an indicator for disaster risk, there is a reverse relation between ex-ante water management as promoted by the Drought Cycle Management Model and household disaster risk. This relation is statistically significant, and shows that water conservation have a positive effect on the nutrition pattern of households, and reduce their disaster risk.

Reinforcement of community coping capacity is a part of the Drought Cycle Management Model. If households can turn to community mechanisms to cover their food shortages, without applying the previous two coping strategies, this reduces their disaster risk. Statistical estimates show that having one's own assets, access to credit, management of livestock, income diversification and water management are all positively and significantly associated with this coping strategy. The last three coping capacities fit particularly well with the approach of the DCM model, demonstrating the mitigating that DCM seeks to have on increasing household's coping capacity and reducing their risk of disaster. In contrast to the previous coping mechanism, relying on emergency relief has no specific relationship with coping capacity within the DCM model. This coping mechanism is widely applied when households have access, respond to weather forecasts, and have limited opportunities to obtain credit from within their own communities. (CORDAID, 2004)

2.4 Disaster Risk Reduction

Disaster Risk Reduction (DRR) is not a radically new concept, but is a valuable way of analyzing humanitarian, development and advocacy programmes to improve their quality and effectiveness in targeting the most vulnerable people. Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal effects of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land, the environment and improved preparedness for adverse events.

Disaster risk is made up of the interaction between hazards, vulnerabilities and capacities. Generally, it is understood in the following formula:

$$\text{Risk} = \frac{\text{Hazard x Vulnerability}}{\text{Capacity}}$$

Therefore, assessments of risks require analysis of hazards, vulnerabilities and capacities.

2.5 International, Regional and Sub regional Policies on Disaster Risk Reduction

The role of the international system and international organizations in disaster risk reduction is to promote awareness and capacity building at all levels. It encourages the use of technology and science, facilitate programme funding and resource mobilization and develop sub regional and regional cooperation. The analysis undertaken here in relation to regional and sub regional levels focuses on the objectives established in the MDGs, the Hyogo Framework for Action and the Africa Strategy. The Priorities for action established in the Hyogo Framework for Action are defined to ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation. This includes the creation of national disaster risk reduction platforms and the integration of disaster risk reduction into poverty reduction strategies. This is to identify, assess and monitor disaster risks and enhance early warning, use knowledge, innovation and education to build a culture of safety and resilience at all levels, reduce the underlying risk factors and to strengthen disaster preparedness for effective response at all levels. (UNISDR, 2009)

2.5.1 The Millennium Development Goals and Disaster Risk Reduction

In many countries and communities, particularly in Africa, the effects of disasters, including loss of human life, the destruction of infrastructure, livelihoods and property and the degradation of the environment, are likely to increase if disaster risk reduction is not integrated into development planning. MDGS have direct impacts on disasters by adverse effects on housing, service infrastructure, saving, means of production, losses affecting the sustainability of livelihoods. Indirect impacts of disasters are serious adverse effects on the macro economy in the short term and on growth, development and poverty reduction in the long term. Many vulnerable households are forced to sell their means of production, which traps them in an endless cycle of poverty and widens inequalities. Therefore, disaster risk reduction can contribute to Disaster risk reduction and MDG one, which is eradicating extreme poverty and hunger are interdependent (UNDP, 2004).Making livelihoods less vulnerable to natural hazards is key to eradicating poverty, reducing inequality, improving food security and alleviating hunger. Reducing the impact of disasters on the macro economy

promotes growth, improves tax revenue stability and ensures the provision of public services, which benefits poor people in particular. Disaster risk reduction and MDG one (eradicating extreme poverty and hunger) share the same strategies and tools. This interconnection means that protecting development from natural hazards can be a very profitable course of action.

2.5.2 Hyogo Framework for Action; Building the Resilience of Nations and Communities to Disasters, 2005–2015

The goal of the Hyogo Framework for Action, adopted by the UN World Conference on Disaster Reduction held in Kobe, Japan, in January 2005, is to reduce substantially the loss of human life, socio-economic losses and damage to the environment caused by disasters by 2015. The strategic goals set by the framework are the integration of disaster risk reduction into sustainable development policies and planning; the development and strengthening of institutions, mechanisms and capacities to contribute to building resilience to hazards; and the systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programme.

The defined priorities for action ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation, including the creation of national disaster risk reduction platforms and the integration of disaster risk reduction into poverty reduction strategies. Identifying, assessing and monitoring disaster risks and enhancing early warning use knowledge, innovation and education to build a culture of safety and resilience at all levels, reduce the underlying risk factors, strengthen disaster preparedness for effective response at all levels. (UNISDR, 2009)

2.5.3. Africa Regional Strategy for Disaster Risk Reduction

Gaps and shortcomings have been identified in the area of disaster risk reduction in Africa. A baseline study was carried out in order to develop the Africa Strategy. It revealed that, for a long time, the focus has been on managing emergencies rather than on developing an approach aimed at reducing disaster risks. While it is true that some initiatives have been undertaken in the area of disaster risk reduction, they remain tentative. Risk reduction measures taken to date do not focus on strengthening traditional coping strategies, nor do they emphasize preserving the local and traditional knowledge and experience that underlie these survival mechanisms.

Disaster risk reduction is accorded low priority in national budgeting. Institutional mechanisms and policies on disaster risk reduction are inexistent or ineffective, and disaster

risk reduction is not adequately integrated in development strategies. Very few countries have integrated this vital component into their national poverty reduction strategies. It was with a view to changing the situation that, in 2004, the Summit of Heads of State and Government of the African Union adopted a regional disaster risk reduction policy in order to "contribute to the attainment of sustainable development and poverty eradication by facilitating the integration of disaster risk reduction into development". Subsequently, a plan of action was formulated to implement this strategy, based on priority areas of action, which are very similar to those defined in the Hyogo Framework for Action. Governments, with the support of international organizations and development partners, are responsible for implementing the plan of action. (African Union, 2004)

Progress has been made in disaster risk reduction with important measures being undertaken within the framework of the Africa Strategy, including the creation of an African regional forum bringing together the focal points of national platforms. This is with a view to sharing disaster risk reduction experiences, information and discussing the implementation of disaster risk reduction strategies; the formulation of sub regional disaster risk reduction policies and the establishment of implementation mechanisms; the creation of the Africa Advisory Group on Disaster Risk Reduction; and the creation of national platforms for disaster risk reduction. However, Africa still has a long way to go. Progress is hindered by the failure to integrate disaster risk reduction at the national and community levels, the lack of financial resources allocated to the implementation of disaster risk reduction programmes and the limited number of countries that have created platforms for disaster risk reduction and/or succeeded in integrating disaster risk reduction into national poverty reduction strategies. (African Union, 2004)

2.6. Influence of Mitigation of Disasters in Enhancing Household Livelihood Security

Disaster mitigation is defined as the lessening or limitation of the adverse impacts of hazards and related disasters. The adverse impacts cannot be prevented fully but their scale of severity can be substantially lessened by various strategies and actions. Mitigation measures encompass public awareness, improved policies, hazard resistant construction. (UNISDR, 2003)

2.6.1. Risk identification and Vulnerability Assessment

Disaster risk identification and vulnerability assessment and analysis is the process of gathering all relevant data about the community and its individual members and use it to

determine the nature and extent of risk by analyzing the characteristics of hazards, the degree of vulnerability and the capacity of the community/individuals to cope. (Land, 2008)

It is done in the specific village and/or community, since each hazard affects different areas and communities differently. Participatory rural appraisal tools are used for effective community participation, for example: the hazard source-force tree, proportionate and pair-wise ranking, Venn-diagrams, social and resource mapping, storytelling, historical trends and vision mapping. The Participatory Disaster Risk Assessment and Analysis (PDRA and A) have the following four steps:

2.6.1.1. Hazard Assessment for communities prone to disasters

A hazard becomes a disaster when it affects a community unable to cope with its effects. If the community is able to cope a hazard event will come and pass without becoming a disaster. The objective of Hazard Assessment is clearly defining the nature and behavior of the hazard. A Hazard Assessment covers ;Identification of all the hazards that the community is exposed to, ranking the hazards in order of importance based on frequency, scale of potential damage (geographically and in relation to the population affected), duration over which the impact is felt and analysis of each specific hazard to establish its distinct characteristics. The cause/origin of the assessment is to know whether the hazard is preventable or only mitigation is possible. Assessment helps to understand the scale of the hazard, how it causes harm, in order to design mitigation measures. Warning signs & signals help the community to establish an early warning system by monitoring the signs and issuing alerts or public information in a timely manner, so that preparedness actions can be carried out before the hazard strikes.

Forewarning provides information on the time span between the warning signs and its impact. This information indicates what type of preparedness measures can still be carried out as the impact approaches. Speed of onset covers hazards that occur without almost any warning (earthquakes); hazards that can be predicted three to four days in advance (typhoon); and slow-onset hazards like drought. Each requires different types of mitigation measures and contingency plans. Frequency helps to know the recurrence pattern of the hazard based on scientific data as well as the communities' experience while the duration is for understanding the length of time during which the impact is likely to be felt to help in planning emergency response measures and lobbying for mitigation measures.

2.6.1.2. Vulnerability Assessment for Disaster Hit Communities

In a Vulnerability Assessment, the location of people and assets at the time the hazard is likely to strike is assessed as the key determinant of their vulnerability or degree of exposure. The assessment helps understand how different individuals/assets are exposed to varying degrees, and the underlying reasons for their location in unsafe areas. It covers identification the elements at risk divided into human elements (by gender, sex, socio-economic situation, etc) and non–human elements (productive assets and critical facilities), deciding their level of vulnerability considering the proximity of the elements at risk vis-à-vis the hazard and analyzing why the element at risk is in that location. The summary of the assessment will show vulnerability levels (high, medium and low) of various elements at risk in that specific community/location.

2.6.1.3. Capacity Assessment for Disaster Hit Communities

The community capacity assessment identifies the strengths and resources present or missing among individuals, households and the community to manage resources in times of adversity. Capacity is defined as the strengths and resources that are available to reduce risk levels and/or hazard impacts. They may include physical, social, institutional or economic means, as well as skilled personnel or collective attributes such as leadership and management. Capacity also refers to strengths and resources that exist for coping with, withstanding, preparing for, preventing, mitigating, or quickly recovering from a disaster. In the context of disaster risk reduction, capacities are analyzed in terms of how strengths, attributes and resources can increase or decrease the disaster risk. Because the behavior of a hazard and the degree of vulnerability determine what capacity is needed to reduce disaster risk, capacities are analyzed in relation to the hazard and vulnerability. In relation to hazards, it is necessary to look at mitigation and prevention capacities, while in relation to vulnerability; it is the individual survivability and community readiness before and during a hazard event.

2.6.1.4. Disaster Risk Analysis for Disaster Hit Communities

Disaster Risk Analysis is a systematic process of consolidating the findings of hazard, vulnerability and capacity assessment to determine the risk levels for various elements at risk. It contributes to the community's awareness about potential disaster risks it was unaware of before, and enables the community to define their community action to reduce disaster risk. It is an essential precursor to decision-making in disaster risk reduction, as well as the formulation of development policies, strategies, plans, programmes and projects.

2.6.2. Contingency Planning Role in Mitigating Drought Disasters

The Contingency Plan entails an analysis of specific potential events or emerging hazard situations that might threaten the community or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and hazard situations. The Contingency Plan provides communities with a guide to what their operational needs are, and the actions needed to manage the hazard events to ensure that they do not turn into disasters. The programme seeks to address policies and functions of authorities to reinforce their planning and rapid intervention capacities to protect vulnerable populations in case of disaster. (Barton, Morton, & Hendy, 2001)

The pre-positioning of resources (fodder, vaccines, and water distribution equipment) utilizes efficient communication between local and central level decision makers. It also addresses information between communities, including cross-border relationships, to avoid tensions between pastoral communities resulting from the scarcity of resources. The participation of both line department and communities at all levels of project implementation encourages sustainability. Programmes seek to build the technical and service delivery capacity of local government in drought cycle management and drought preparedness to enable local government to provide and receive relevant information to and from the community to ensure that pastoralists can plan contingency measures ahead of droughts. A number of projects visited work with local government on activities linked to local policies and guidelines on water and livestock .The objective of the contingency plan is for community systems and structures to save more lives and reduce the damage. Both the Development Plan and the Contingency Plan are task functions that become the basis of measuring the progress in implementation of DRR measures. (Choularton, 2007)

2.6.3. Capacity Development Role in Mitigating Disasters

Capacity development is the building and maintaining the ability of people, organizations and society to manage their risks successfully themselves. This requires not only training and specialized technical assistance, but also the strengthening the capacities of the communities and individuals to recognize and reduce risks in their localities. It includes public awareness and training, sustainable technology transfer, information exchange, network development, management skills, professional linkages and other resources. (UNISDR)

The development and contingency plans have to be implemented by the community with or without support of other development actors. It is imperative that the community forms a

functional organization, or strengthens an existing one, to implement the disaster risk reduction plan and undertake further measures to build resilience. Community organizations should include the people most at risk, and must be owned by the greater community. The organizations will implement, monitor, evaluate, learn and engage in lobby and advocacy for/with the larger community. The facilitating organization should build the capacity of the community organization in relation to organization development and DRR task accomplishments. (World Bank, 1995)

Education for disaster risk reduction is an interactive process of mutual learning among people and institutions. It encompasses far more than formal education at schools, universities and in training courses. It involves the use of traditional wisdom and local knowledge to safeguard against natural hazards as well as the active and informed participation of the mass media. The effects of drought can substantially be reduced if policymakers, scientists, media and all the public are well informed and motivated towards a culture of disaster prevention and resilience. This requires sustained efforts to educate all segments of society that are vulnerable to the disastrous effects of drought. Education is a crucial means within society to communicate, motivate and engage, as much as it is to teach awareness about drought risks and dangerous needs to start in early education to create a culture of disaster reduction. The various dimensions of disaster risk within a community can be addressed and continuously reinforced and passed between generations through formal education programmes and professional training, which is part of knowledge management. (UNISDR, 2009)

Effective knowledge sharing is more than information dissemination. It is a dynamic process where communities, development workers and other stakeholders interact. Knowledge sharing moves away from a focus of informing and persuading people to change their behavior or attitude, to a focus on facilitating exchanges between different stakeholders to address a common problem. (Besset G, 2004)

2.6.4. Early Warning Systems as a Mitigating Measure to Disaster Risks

The system was initiated first in Ethiopia in 1987. Various Early Warning Systems (EWS) have evolved in the Greater Horns of Africa (GHoA). Indicators include climate, natural vegetation, crops and livestock, and the household food baskets. Early warning systems are normally comprised of various elements. They can stem in part from information provided by meteorological offices, or by a Ministry of Agriculture (for example, crop forecasts). One

major criterion for an effective plan is an established system to ensure the coordination of all these different inputs. Early warning and information systems are key tools for mitigating disaster impacts. In the past 20 years, considerable progress has been made in improving systems for providing short-term advance information on extreme weather events, flood surges, volcanic eruptions and food crises, which allow timely action to be taken in the realm of disaster management. (Adger, Kelly, & Ninh, 2001) Ensuring that appropriate information systems are in readiness includes stimulating information exchange systems within each agency in the emergency environment, between organizations and between the organizations and the public. The most appropriate means of gathering and disseminating early warning information must be carefully assessed and well defined within the disaster preparedness plan. It is imperative that early warning messages be understood by the people for whom they are issued.

Botswana is a good example of where early warning system has been implemented. Aware that a functioning early warning system is critical in disaster prone countries, the government formally established a drought early warning system (EWS) in 1984 after a series of draughts to enhance draught preparedness, mitigation and response. The EWS relies on a variety of data indicators related to human nutrition, agriculture, rainfall and climate to assess draught risk. The resulting draught risk assessments are used to produce monthly and annual reports. These reports are then used by government decision makers to monitor the situation, and when appropriate make the decision to formally declare drought a disaster. (UNISDR, 2009) The EWS in Botswana has greatly reduced the impacts of draught by incorporating real-time information into the draught management and mitigation processes. The EWS helped the government implement effective draught response programmers to communities at risk. The programmes included the provision of subsidies such as free seeds, two meals a day for school going children, livestock subsidies through a reduction in feed prices and food rations for destitute persons. There were also a programme to monitor borehole and dam water levels and quality. The Botswana EWS has managed to save lives by providing timely technical information needed to assess the countries drought risk and mobilize drought response efforts. It has also improved the speed and efficiency of the government’s response to drought situations. The EWS minimizes human and economic losses and ensures that relief efforts are targeted specifically to those in need. (UNISDR, 2009)

2.7. Enhancing Household Livelihood Security through Preparedness for Disasters

Disaster preparedness involves forecasting and taking precautionary measures prior to an imminent threat when advance warnings are possible. Preparedness planning improves the response to the effects of a disaster by organizing the delivery of timely and effective rescue, relief and assistance. It involves the development and regular testing of warning systems (linked to forecasting systems) and plans for evacuation or other measures to be taken during a disaster alert period to minimize potential loss of life and physical damage. It also involves the education and training of officials and the population at risk, the training of intervention teams, and the establishment of policies, standards, organizational arrangements and operational plans to be applied following a disaster. Effective plans also consider securing resources, possibly including stockpiling supplies and earmarking funds. These plans must be supported by enabling legislation. By implementing this, the household livelihood security will be enhanced since the community will be empowered with knowledge and skills that will help them come up with measures that will help them limit the full force of the disasters and hence losses when disasters strike will be minimal and manageable.

2.7.1 Community Based Natural Resource Management in Disasters Preparedness

Community-based organizations are typically resource user groups, local management committees, villages and village councils and associations, communities, or a set of communities that have some degree of common identity and cooperation based on proximity, social and economic interaction, and interdependence in use of resources**.** (Uphoff.N, 1998)

Community-based natural resources management was a response to what were perceived as fairly top-down, technocratic, inefficient projects of the 1970s and early 1980s. The involvement and empowerment of local communities in the design and implementation of Natural Resources Management (NRM) is the most frequently cited factor for project success in the community-based land management. Supported by the World Bank, it improved community-based natural resources management that was initially the major thrust of the projects, but they slowly moved toward broader goals of managing community land, in recognition of the importance of local capacity building, land tenure, and the need to respond to people's priorities. Social infrastructure typically became a supportive element, due to its high demand, and was to some extent provided in order to foster NRM, which was the main goal of the intervention. Social services, such as provision of wells or a local school, are therefore used as incentives and ways to develop an initial rapport. More specifically, the

objectives of the community-based land management approach are typically to provide communities with the operational capacity to initiate and implement activities designed to improve production, quality of life, and the natural environment, and to provide communities with the authority and administrative and legal power to manage the resources of their land. Ideally, the approach is assumed participatory, flexible, and iterative. By using techniques from participatory rural appraisal, village communities interact with project field staff in the planning process. They express their needs, priorities, and constraints, based on their knowledge of their land and its resources and perceptions of ways to solve their own problems. (Lewis, 1997)

In Somali, Save the Children UK an International NGO is increasingly promoting interventions that embrace Disaster Risk Reduction principles through community based natural resources management. In 2007, SC UK began to work with pastoral and agro pastoral communities of Shinile and Dembel districts in Shinile Zone to explore lasting solutions to the Natural Resources Management (NRM) problems faced at the local level. Community action plans on natural resource management were beneficial in immediate income. Cash for Work beneficiaries received an immediate cash injection, which represented a 2% of minimum food needs or 3% of the estimated total income of poor households in the 2009-10 year for only 10 days of work (King et al). Another benefit was the conversion of under-utilized land. Hectares of land that had been abandoned due to the encroachment of invasive species, soil erosion and degradation were converted to productive uses. One 4.5ha plot of previously farmed land was cleared of invasive species and later used to cultivate maize, sorghum, vegetables and fruits. A grazing area that had been abandoned due to degradation from drought and water runoff was rehabilitated with diversionary canals. The rehabilitation also re-opened 400km² of grazing land now being used by over 500 households. There was also increased access to food. This is because rehabilitated land was used for cultivation and improving grazing in degraded areas, both of which have a direct effect on increasing access to grains, fruits, vegetables and milk on household and community levels.

2.7.2 Supplementary Feeding of Livestock in Preparedness to Drought Disaster

The programme targets community animals health workers and essentially and upgrades their technical knowledge and in some cases, their business skills. Supplementary feeding interventions include provision of hay, supplements and some pasture related interventions. A

supplementary animal feeding program was set up for 1,200 households in Shinile district of Ethiopia. Each household received 50kgs of wheat bran with which to feed their weak cattle. In Chifra district, the feeding focused on 400 of the most vulnerable households who owned the fewest animals—targeting the sick, lactating and/or pregnant livestock for a maximum of a month. Beneficiary households were identified though public meetings, and from the recommendations of community leaders and elders, in line with the national guidelines for emergency relief interventions. The supplementary feeding ensured a significant number of livestock were not lost. (Save the Children, Ethiopia)

2.8. Response to Disasters in the Enhancement of Household Livelihoods Security

Responding to disasters is the provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduces health impacts, ensure public safety and meet the basic subsistence needs of the people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief. The division between this response stage and the subsequent recovery stage is not clear–cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage (UNISDR, 2009).

According to Kellet, J. and H Sweeney (2011), there are two types of disaster response, late response and early response. The first component of this study seeks to compare the cost of late humanitarian response, to early response, to building resilience to drought. While humanitarian action is clearly required in certain situations, the overall goal is to ensure that human populations can cope with crisis and continue to develop.

Late response to drought results in humanitarian intervention. Food and non-food aid are required to ensure that the population affected survives. Because a humanitarian crisis has been reached, and response is late, loss of life and livestock are excessive. Furthermore, while aid helps to ensure that people survive, a downward cycle of asset depletion is evident, and the caseload for humanitarian intervention is seen to increase over time (both in terms of the number of people requiring aid, and the number of months that aid is required on average). When the next drought hits, households have typically not recovered asset levels from the previous drought.

Early response is undertaken to ensure survival at the time of early warning of a crisis. In this case, action is taken before the onset of significant livestock deaths. Interventions are not

necessarily different from those taken in late response above, but importantly they are taken at the first signs of a potential drought. Food and other aid Economics of Resilience are still required to ensure that the population affected survives. However, the impact is far less at this stage (populations have not yet reached destitution) and therefore per capita intervention costs are smaller, and the duration that aid is required is shorter. Furthermore, the unit cost of procuring and transporting food and other aid is much cheaper. It is further assumed that 50% of excess adult animal deaths can be commercially destocked and converted to sales through early intervention.

2.8.1 Livestock Interventions in Response to Disasters.

Livestock interventions in response to disasters include commercial destocking, slaughter off take and animal health interventions. Commercial destocking is an early intervention, in which traders are facilitated to buy animals off of households before the animals reach a weakened state, ensuring that households get a good price and have money to spend on other needs, such as feeding and caring for remaining animals. This activity builds on existing marketing structures and is designed to improve the access to markets. This is done in a number of ways such as transport subsidies or through direct purchase of livestock at points where livestock bought mainly for immediate transport and slaughter. (Venton C, 2012)

In Kenya, the Kenya Meat Commission (KMC) has acted as the trader and producer and has delivered the livestock at the final collection point. Kenya Meat Commission also buys livestock directly from producers in affected districts and transported to the slaughter at their own risk. In the inventory, the only examples of commercial de-stocking are the KMC interventions.

Evidence indicates that money raised through commercial destocking can then be used for other coping mechanisms, such as buying food for human consumption, and feed or veterinary services for remaining animals. It is also likely that a reduction in number of animals will reduce pressure on existing water and forage supplies for the remaining animals. This activity was first piloted in Samburu district, Kenya by OXFAM during the 1984 draught. For some time it was used as the last resort intervention where livestock mainly shoats which are already in poor condition are bought by agencies and are then slaughtered and in most cases the resultant fresh meat is distributed to needy families in the community. The meat could also be dried and distributed. However, this is rarely used at present.

The main activities in the category of human health include vaccination, control of ecto/endo parasites, and provision of drugs and associated trainings. In Ethiopia, vaccination and mass treatment campaigns were carried out in the Chifra and Ewa districts of Afar region, reaching over 168,300 livestock belonging to 2,367 households. Vaccination at this early stage can reduce vulnerability to disease outbreaks, such as small pox, and substantially improve livestock resilience by eliminating parasites. The vaccination campaigns provided the district governments with an opportunity to improve their capacity for disease surveillance and provide veterinary services. The campaigns also stimulated the work of the community animal health workers (CAHWs) and their linkages with district offices, private pharmacies and pastoralist communities. (Sanford & Habtu, 2000)

The use of a voucher system was found to be very efficient, in terms of both the logistics and achieving coverage of the beneficiaries reaching the livestock of the most vulnerable at a very critical time. Response activities also involve the strengthening of animal health systems. Healthier animals are more able to survive drought as they can walk further to water and rangeland. (Save the Children, Ethiopia)

2.8.2 Role of Alternative livelihoods as a Response to Disasters.

The seeking of alternative livelihoods by pastoralists is not a new phenomenon in East Africa, as many nomadic livestock-keeping people have historically utilized ties with foraging, farming and recently urban communities in times of drought and conflict. But the settling of former pastoralists has increased dramatically in the past half century, driven mainly by impoverishment and stock loss due to reduced mobility, drought, raiding, and political instability while simultaneously attracted to the benefits of settled life including food security and physical security, health care, formal education, and new economic opportunities. Former pastoralists have settled in rural, urban, or peri-urban settings to seek new livelihoods as farmers, agro-pastoralists, and town dwellers engaged in trade, wage labor, and craft production. Formal education has been a primary benefit to children in these communities who as adults have pursued employment in government, business, and non-government organizations. (Swift, Barton, & Morton, 2002)

Alternative livelihoods in northern Kenya are based on a variety of strategies, including the marketing of livestock, dairy products, hide and skins, and cultivated crops. A variety of wage-earning occupations range from professional to manual labor; entrepreneurial activities including shop keeping; craft production, sales and transportation. With the exception of

livestock, women play a key role in petty commodity trade activities, particularly the sale of garden vegetables, tobacco, and mira'a, (khat), and at lower rungs of the economic ladder, firewood or charcoal sales, beer brewing and prostitution. Alternative strategies for men include wage-earning labor in construction, truck driving, security work, farm work, and shop employment, and entrepreneurial occupations including shop keeping, construction, and transportation. Education has played an increasing important role, particularly in obtaining professional employment in hospitals and health clinics, government offices, military and police, and employment in non-government organizations.

2.8.3 Emergency water services as response to drought disaster

Water is essential for life, health and human dignity. In extreme situations, there may not be sufficient water available to meet basic needs, and in these cases, supplying a survival level of safe drinking water is of critical importance. Over the last four to five years, the arid and semi arid districts of Kenya have faced water deficiencies, attributed mainly to below normal rainfall. This has forced households to walk for between 20 and 30 km in search of water for domestic use as well as for livestock. Nearer water sources have dried up, or become contaminated, while pumping equipment in case of boreholes, have been overused during emergencies. The benefits of access to clean water are numerous, and include decreased incidence of water borne illness, reduced time collecting water, and increased attendance at school. Access to water values reduced time collecting water, using the assumption that rural households typically travel over an hour to water sources, and international standards for water access to be within half an hour walking distance. The time spent collecting water is high in drought periods, when pastoralists often have to travel for a full day to get water on a regular basis, decreasing in normal times.

Other range of benefits includes timesaving, increased productive days, avoided health costs, and avoided morbidity and mortality. Benefits will also include the reduced cost of food and non-food aid, as well as the reduced loss of animals. It is not known how much clean water can contribute to this reduction

Over the last five years, humanitarian organizations, particularly in the arid and semi arid districts of Kenya have increased the use of Emergency Water Trucking (EWT) as an intervention to provide water to communities and households during drought-related emergencies. Emergency water trucking/tinkering (EWT) is increasingly becoming a common method for delivering water during a drought emergency while more long-term measures are being put in place. This is particularly in cases where the emergency is thought

to be temporary and the situation is expected to soon return to normal, or where security and political problems make it difficult to change to a more sustainable approach. (Ministry of Water and Irrigation, 2005)

In Ijara district, Kenya the Ministry of Water and Irrigation (MOWI) has three water bowsers of 12,000litres, 10,000litres and 8,000 litres respectively and trucks water to three communities of 4,000 people due to prolonged drought. Each community got trucked water twice a day. The Ministry used over Kshs 200,000 per month for water trucking. One of the challenges the Ministry is faced is that the communities did not have storage tanks and it is that forced it to deliver the water into water pans or 13 temporary polythene storages. (Ministry of Water and Irrigation, 2005)

2.9. Recovery/ Reconstruction from Disasters influence on household livelihood security

Disaster recovery is the restoration and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. The task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should and should be based on pre-existing strategies and policies that facilitate institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and apply the build back better principle. (UNISDR, 2009)

2.9.1. Cash for Work's Role in Recovery from Disasters.

Cash for work is a form of cash transfer that helps households to get another source of livelihood apart from their normal mode of living. The transfers are made to vulnerable households, which enables vulnerable people to build assets in good years and improve their ability to cope in bad ones. Families who are able to work receive cashing exchange for their labour.

Turkana District of northwestern Kenya has endured repeated droughts for the last 10 years. Drought combined with environmental degradation and increased population necessitated annual 'emergency' appeals since late 2003. Oxfam staff realized that distributing food alone was not helping food-insecure people to reduce their vulnerability to further droughts and other hazards. A recent Household Economy Study for the area found that the proportion of households within the poor and very poor wealth groups has grown in the last decade.

Drought in itself was not the disaster. Rather, drought combined with a long-term decline in pastoral livelihoods left people extremely vulnerable and unable to cope when drought hit. In an attempt to break this destructive cycle, Oxfam GB began a series of pilot Cash for Work (CFW) programmes in Turkana in 2005. The pilots targeted up to 10,000 people with timely and predictable cash transfers each month for between six and nine months. The transfers were made to vulnerable households even when the rains were good. This enabled vulnerable people to build assets in good years and improved their ability to cope in bad ones. Families who were able to work received cashing exchange for doing so. The work focused on infrastructure projects identified by the community. They were labour -intensive and technically sound. These projects also contributed to reducing vulnerability for example, by maintaining water sources. Those who could not work, such as elderly people, were given direct help. The cash was provided alongside emergency food relief (when available), which ensured that the cash was used to support livelihoods development rather than all being spent on food.

Another organization involved in this programme is United Nations Development Programme. UNDP's interventions are informed by significant experience in working where disaster and conflict interface. UNDP is currently implementing livelihoods restoration programmes in drought-hit regions but these efforts are in need of substantial scaling-up to be effective in the face of the current crisis. Through 'cash (or vouchers)-for-work' and other livelihoods interventions, UNDP provides immediate resources to vulnerable households with short-term employment and much needed cash to provide access to food and basic needs. By guaranteeing that cash and food will be provided, this kind of programme protects people from the adverse effects of shocks and gives them the means to plan for their future. By linking humanitarian and development approaches, it is proving far more effective than annual emergency food assistance alone. The project also complements other livelihoods programmes (public health, livestock marketing, and livelihood diversification).

2.9.2. Improved Governance of DRR Institutions as a Recovery Measure from Disasters

Disaster management institutions need to be strengthened if DRR is to be integrated into development. This requires that the governance of these institutions be improved and that they develop the requisite capacity with adequate and secure resources. Legislative improvements are needed in most countries, with particular emphasis on monitoring and enforcement, using inclusive and participatory processes, and coordinating and harmonizing

activities with relevant stakeholders. Specifically, legislation or partnership agreements are strongly needed to better define the roles of multiple stakeholders in DRR.

2.9.3 Infrastructure Development and Rehabilitation as a Disaster Recovery Measure

After a disaster, it is important to construct and repair various infrastructures damaged by the disasters to help the households resume their normal or even better their livelihoods. This is done by various organizations, the local government, community, non-governmental organizations. Community participation is important for these projects to remain sustainable.

UNDP has helped repair essential infrastructure needed to reactivate livelihood systems after the rains return and reduce vulnerability to future drought, such as water canals, boreholes, feeder roads, market facilities and grain storage, along with the rehabilitation of agricultural land. UNDP has also previously provided assets that could be used for immediate income generation at household level, such as start-up kits and support packages for small enterprises hence increasing affected men and women's income and help improve food security. In areas where farmers and agro-pastoralists were, worst affected UNDP supported the re-stocking of small livestock and the provision of agricultural inputs such as drought-resistant seeds. Such initiatives were carried out in coordination with other UN actors, for example with the Food and Agricultural Organization (FAO) in Ethiopia and Somalia. (UNDP, 2004)

In Mandera West in Kenya, the Constituency Development Fund (CDF) and Arid Lands Resource Management Project (ALRMP) had funds available to construct underground water tanks. The communities were able to construct three underground tanks of 800,000 litres each capacity to collect run-off rainwater for use when surface water in ponds and earth pans are exhausted. Water was provided to 9600 people for 2-3 months into the dry season, and the walking distance to collect water was reduced from 30km to an average of 2km. (Ministry of Water and Irrigation, 2005)

Rehabilitation of water points consists of reconstructing and maintenance of the available water points like dams, rivers, streams and boreholes. The water points are critical resources to many households and communities faced by drought disasters. The resources can be rehabilitated by members of the household participating in the cleaning or digging the dams. Some households prefer to pay a fee for the same to be done. Non-governmental organizations too have been active in funding the rehabilitation of critical water points on behalf of the community in many affected areas. In Ethiopia, during the seasonal assessment

of mid November 2009, several of the available water points were found to be non-functional, either because they had dried up or because of poor management, lack of minor maintenance and lack of tools and spare parts. In Chifra some communities were travelling 10 to 12 kilometers to fetch water. A total of eight of the non-functional water points were maintained within the first three months of the drought emergency (i.e. Dec'09 to Feb'10) benefitting over 34,941 people. Four motorized pumps were maintained in Ewa, and two motorized pumps and two hand pumps were maintained in Chifra. The water rehabilitation support improved the water coverage of Chifra district by 3% and Ewa by over 8%. The intervention also encouraged the local government to carry out regular monitoring of existing water points enhancing district level planning for assessing stocks of tools and spare parts, and planning routine maintenance. To ensure sustainability the project trained 103 Water User Committee (WUC) members, drawn from over 10 water points, in water and sanitation, management and minor maintenance skills, According to Woreda officials the training reduced the frequency of complaints coming from communities about damage and requests for minor maintenance. The support also helped women by reducing the distance they needed to travel to fetch water.

2.9.4. Natural Resources Management as a Drought Relief Measure.

Reciprocal resource sharing is one of the best interventions in the natural resources management that are used in recovery from disasters. This is best demonstrated by the pastoralist communities living along the Ethiopia and Kenya border who have been sharing pasture and water for centuries. The Borana, Gabra and Gari have a common language. They practiced reciprocal resource sharing in the past by migrating between the two countries as dictated by prevailing weather conditions. (Makombe, 1993) However, politically motivated boundary conflicts have increased in recent times and this has adversely affected mobility of pastoralists. This new development coupled with increased human and livestock populations, lack of marketing and other livelihood development options and increased pressure on the natural resource base has made these pastoralists very vulnerable to drought and other shocks. (Uphoff.N, 1998)

To curb this, there is need for all households and communities to participate in the management of natural resources like pasture and the range. Good management of pasture after drought where the community agrees to save a range of land incase of disasters.there is also need for harvesting of excess grass during the rainy season in preperation for tough time.

The communities commonly affected by drought should come up with laws and measures to govern the sustainable use of the natural resources to avoid shortage during the drought.

2.10 Conceptual Framework

This conceptual framework is a figure that shows the relationship between different variables. Disaster risk reduction plays a major role in enhancing livelihood security among vulnerable households. Disaster risk reduction comprises of mitigation of disasters, preparedness for disasters, response to disasters and finally recovery from disasters. Disaster mitigation helps in putting in place measures that can help to control the magnitude of a disaster. Disaster preparedness is also a way of putting preventive measures in case of a disaster so that the community does not suffer the full effects of a disaster. Response from disaster is a damage control measure that is undertaken when the disaster takes place. It helps reduce the effects of the disaster on livelihoods. Recovery is the aftermath of a disaster. Communities are assisted to overcome the effects of a disaster by helping them regain their normal or better livelihoods. The explained are the independent variables in this study since for livelihood security to be achieved; it will depend on the named variables. However, other variables may also indirectly influence the enhancement of household livelihood security like government policies. These are known as mitigating variables. Culture is an intervening variable which may influence the livelihoods in some way.

Figure 2. Conceptual Framework

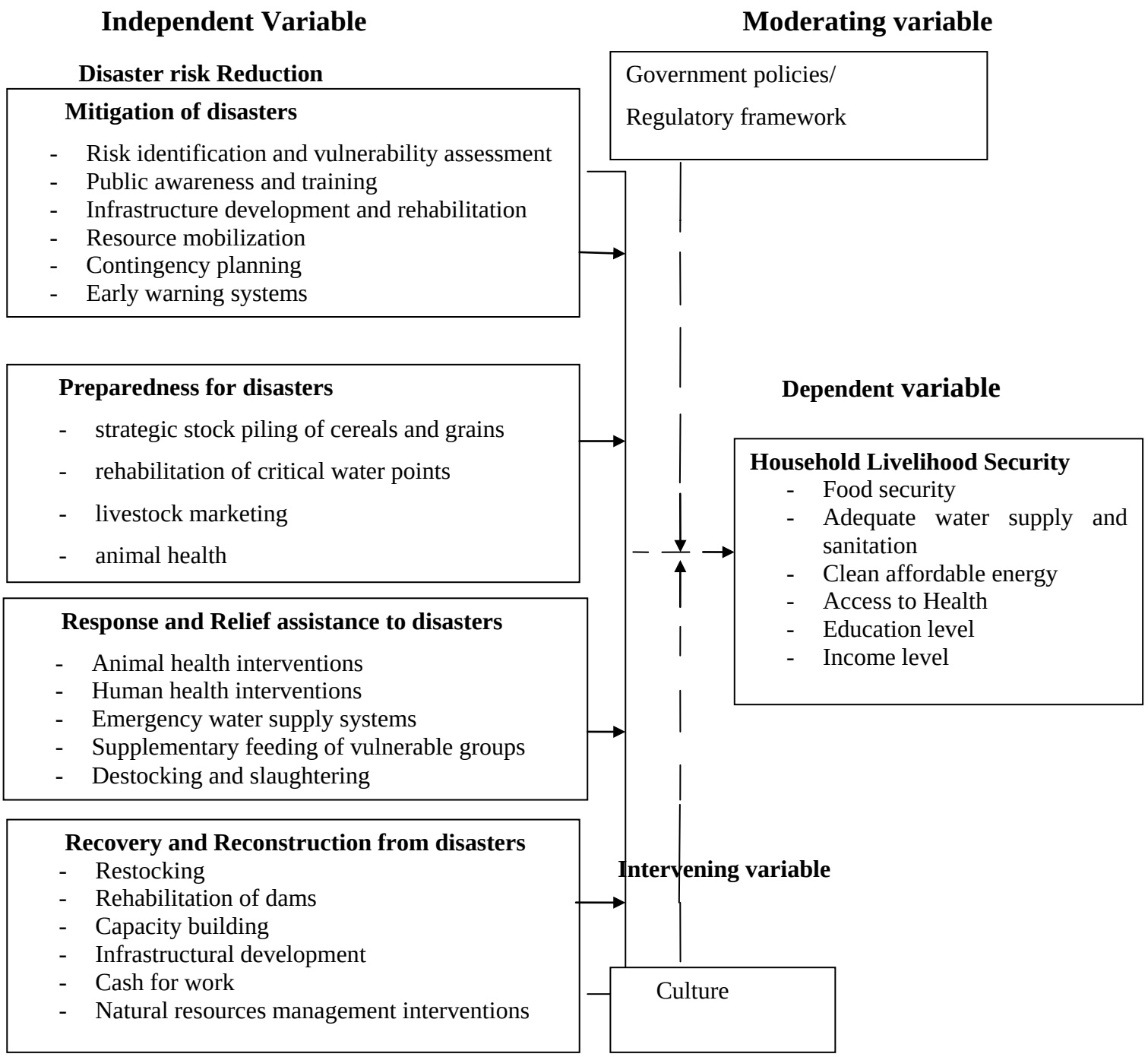

Table 2.1. Operationalisation of Variables Table

Objective	Variables	Indicators	Measurement	Data collection Method	Data analysis
1.To establish the influence of disaster mitigation on household livelihood security	Dependent: household livelihood security	Households Income, food security, health, education, shelter, adequate clean water.	Ordinal	Key informant interviews	Descriptive
	Independent: disaster mitigation	Risk assessments, trainings, contingency plans, and early warning systems.	Ordinal	Key informant interviews /questionnaire	Descriptive
To assess influence of disaster preparedness on household livelihood security	Dependent:				
	Independent: preparedness for disasters	Availability of livestock markets, availability of vaccination services, availability of cereals and grains stocks.	ordinal	questionnaire, key informant interviews	Descriptive
To establish the influence disaster response to household livelihood security.					
	Independent: Response to disasters	Human and animal health interventions, emergency water supply, supplementary feeding of vulnerable groups, destocking and slaughtering.	ordinal	Key informant Interviews /questionnaire	Descriptive
To establish the influence of reconstruction from disasters to household livelihood security	Dependent:				
	Independent: reconstruction from disasters	Rehabilitation of critical water points, alternative livelihoods available, management of natural resources, infrastructures rehabilitated and developed.	Ratio	Key informant interviews /questionnaire	Descriptive

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gave an outline of how the study was carried out. It describes the research design, the target population, the sample and sampling procedure, research instruments, validity and reliability of instruments, data collection and data analysis procedures used.

3.2 Research Design

In this study, the researcher used descriptive survey research design. Descriptive survey design is a method of collecting information by interviewing or administering a questionnaire to a sample of individual. It can be used when collecting information about people's attitudes, opinions and habits (Orodho and Kombo, 2002). This design is preferred because it will ensure proper construction of questions for soliciting the required information; ensure identification of the individuals surveyed; identify the means by which the survey will be conducted; and summarizing the data in a way that will provide descriptive information. The researcher preferred this as it assisted in collecting the data from different parts of the district and it allowed the generation of both numerical and descriptive data that was used in measuring correlation between variables. Descriptive survey enabled the researcher to generate statistical information about how disaster risk reduction enhanced household livelihood security in Laikipia North district. This study used both qualitative and quantitative methods of data collection. The two were used to ensure that as much data was captured regarding the study and as a way of triangulating the information gathered. (Kothari, 2008)

3.3 The Target Population

The study targeted the household heads of the nine locations within Laikipia north district whose households were frequently affected by disasters in the form of draught. It should be noted that Laikipia North District has only one division with nine locations and hence the reason various locations were sampled. The main reason for interviewing household heads was to enable acquisition of consistent information in terms of households' livelihood security.

The households included mostly of pastoralists and some marginal agro-pastoralists whose livelihood was mostly affected by the draught disaster. The target population had its own coping strategies to these disasters. Three locations were purposely selected from the district and had a total of 197 households.

3.4 Sample and Sampling Procedures

The study applied both probabilistic and non-probabilistic procedures of sampling. Laikipia north district consists of one division, Mukogondo division and nine locations. Hence, this study was conducted in the three locations of Laikipia North district namely Mukogondo, Ilpolei and Ilmotiok. Out of the nine locations, three locations were purposively selected, based on their representativeness of the disaster risks, their historical disaster encounters and convenience of data collection. Purposive sampling is used when information can only be obtained from a specific source, Mugenda and Mugenda (1999).

The total number of the households in each location was established, and a sampling interval of 10 was determined. In Mukogondo location, the total numbers of households identified were 704 each with one household head; based on the systematic interval of the households therefore constituted a sample size of 70 respondents. In Ilpolei, out of 793 households, the interval led to sampling 79 households. In Ilgwesi, 484 households were present hence the selected number of households was 48. Three chiefs for each location were also included in the sample. Therefore a total of 197 questionnaires were administered to the respondents (household heads) and 3 interviews done to three chiefs who were the key informants in this study.

After the sample size was determined, systematic random sampling was used to select the households from the population. The systematic or modified random sampling was easy to use since the sample size has already been identified. The total number of the population was divided by the sample size to determine the sampling interval. The sampling interval was then used as a constant to select distance from one household to the other. This was done `with assistance from the chiefs who assisted in listing the households. In this research, since the sample size was 10% of the target population, then the constant sampling interval was 10 for all the locations. Therefore, every 10th household was selected as a sample.

Table 3.2 Sample Size

District	Location	Target population	Sample size	Key informants	Total
Laikipia North	Mukogondo	704	70	1	71
Laikipia North	Ilpolei	793	79	1	80
Laikipia North	Ilgwesi	484	48	1	49
Total		1981	185	3	197

Sourced from Kenya National Bureau of Statistics

3.5 Research Instruments

In this study structured questionnaires and key informant interview guides were used which assisted in guiding the respondents in answering the questions. This type of questionnaire was easy to administer, as it gave the respondents alternatives in responses (Mugenda & Mugenda, 2003). To allow the respondents more space to respond on certain issues, the study also included unstructured or open-ended questions in the questionnaires in order to collect relevant data for more information. Interview schedules were used to assist in gathering more information that could otherwise have been missed out. The questionnaires comprised of questions standardized for all respondents.

3.6 The Pilot Study

Once the instruments were developed, they were administered to a sample with similar characteristics as the one that was used for the study. This helped the researcher to ascertain whether the instruments were able to deliver the desired results. The purpose of the pilot study was to pre-test the research instruments that were developed by the researcher. This served to give an advance warning about where the main research project would fail, where research protocols may not have been followed, or whether the proposed methods or instruments were inappropriate or too complicated. It also served to check the validity and reliability of the developed instruments. The researcher managed to get 25 respondents from Naibor location, Laikipia East district which has the same characteristics with the study area to participate in the pilot test

3.7 Validity

Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are (Joppe, 2000). The validity of the instruments developed was determined through consultative discussion between the supervisor and the researcher. Through this, the researcher was able to see whether the developed instruments would measure the concept the researcher intended. .

3.8 Reliability

The extent to which results are consistent over time and an accurate representation of the total population under study (Joppe, 2000). The instruments should ensure that there is some form of consistency to ensure that the research is of quality.

Reliability of the instruments was tested through the test-retest method to check whether the participants' responses would change over time. Once the instruments were developed, the researcher administered the instruments to a population similar to the one to be used in the study. The data was collected, analyzed and the findings recorded and after two weeks administered the same instruments to the same participants to check whether the same results would be achieved as would be expected. A correlation coefficient was calculated to determine how closely the participants' responses on the second time matched those given the first time. A correlation coefficient between 0 and 1 was expected. If the co-efficient was below 0.5, these instruments would be seen as unreliable and the researcher would go back to develop new instruments. If the co-efficient was above 0.5, the instruments would be ruled as reliable and the actual data collection could start.

3.9 Data collection procedure

Data collection was done through administering questionnaires for each household heads and also through interviews to the key informants. Sampling intervals were first identified for each of the purposively sampled location. Administration of the questionnaires was then conducted to the samples. This was done for a period of two weeks. In the sampled household where the household head was not available to respond to the questions, a call back was done later. The filled in questionnaires were then keyed to Statistical Package for Social Scientists (SPSS) after coding the data. The database was then backed up for analysis

3.10 Data Analysis

In the data analysis, descriptive and inferential statistics were applied. The purpose of descriptive statistics was to enable the researcher meaningfully describe a distribution of scores or measurements using a few indices or statistics. (Mugenda & Mugenda, 2003) Inferential statistics were used to utilize sample data to make estimates, decisions, predictions, or other generalizations about a larger set of data. After data collection, and prior to data analysis, the data was first refined to eliminate any undesired or unwanted information that could have made the analysis difficult. This was done through organizing and editing the data to remove any repetitions, inconsistencies, errors and anything not well understood as was presented by the respondents. It was followed by coding the data to establish how possible answers would be treated by assigning to them numerical values. The resultant data was then be stored in both soft and hard copies for reference during the analysis process. Qualitative data generated from questions was organized into categories according to how the study took course. This helped in the identification of any information found relevant to the research objectives and research questions. The data was tabulated and classified as per the characteristics observed and then analyzed in its own class using the frequency tables. The simplest way to present data was in frequency or percentage tables, which summarized data about a single variable. The data was then presented in frequency and percentage tables using Statistical Package for Social Scientists (SPSS) and Microsoft Excel (M-Excel) for analysis and presentation. (Orodho, 2003)

3.11 Ethical Issues

The researcher sought authority for conformity and in ensuring the study was not discontinued in the process. Authority was sought from the University of Nairobi which assisted to seek consequent permissions to conduct the study. Permit for the study was also sought from the National Council of Science Technology and Innovation through an application form designed by the Council. The researcher also sought consent from participants through talking and explaining to them the purpose of the study and highlighting the possible benefits of community based disaster risk reduction. Confidentiality was met and adhered and carried without deception or promises for rewards. The researcher ensured that all respondents participated on their own will without being coerced or deceived with gifts.

3.12 Dissemination Plan

In order to disseminate findings, the researcher will publish findings in a selected journal. The information will also be brought to the public domain through a seminar involving stakeholders. The community will be reached out through a public baraza.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter focused on data analysis, interpretation and presentation. The purpose of this study was to investigate how community based disaster risk reduction enhanced household livelihood security in Laikipia North District, Laikipia County. The objectives of the study were to assess how disaster mitigation, disaster risk preparedness, disaster response and disaster recovery influenced household livelihood security in Laikipia North District, Laikipia County, Kenya.

4.2 Response Rate

The response rate of the 2 categories of respondents is presented in Table 4.1

Table 4.1: Response Rate

Category	Sample Size	Response	Percentage
Household heads	197	189	95.9
Chiefs	3	3	100

Table 4.1 illustrates the response rate of the respondents who were sampled and interviewed in the study. The study targeted 197 household heads and 3 local chiefs from Mukogondo, Ilpolei and Ilgwesi locations respectively. The response rate was 95.9% for household heads and 100% for the chiefs. This is a good return rate since it is able to provide a close to actual information on what is on the ground. This high response rate was attributed to the fact that the researcher employed four well trained and experienced research assistants to personally administer the questionnaires and ensure they were well translated and filled in by the respondents.

4.3 Demographic Data of the Respondents

The researcher found it crucial to ascertain the broad information of the respondents since it provided basis under which the study could fairly produce relevant information. The analysis relied on this information in classifying the different results according to their knowledge and responses. This section looked at the respondents' gender, age and education levels.

4.3.1 Gender of the Household Heads

In this section the researcher sought to establish the gender of the household heads. Their responses are highlighted in the Table 4.2.

Table 4.2: Gender of the Household Heads

Category	Frequency	Percentage
Males	161	85.2
Female	28	14.8
Total	189	100

From the table 4.1, 85.2% of the household heads were males while 14.8% of the household heads were female. This section is able to explain the gender roles of the community under study. Majority of the household heads interviewed were male. This is attributed to the gender roles of the above community where men are regarded as the household heads.

4.3.2 Age of the Household Heads

In this section the researcher sought to establish the age of the household heads. Their responses are highlighted in the Table 4.3.

Table 4.3: Age of the Household Heads

Category	Frequency	Percentage
Under 30 years	18	9.5
30 years to 40 years	106	56.1
41 years to 50 years	58	30.7
Over 50 years	7	3.7
Total	189	100

From the table 4.3, the majority of the household heads were aged 30 years to 40 years with a percentage of 56.1, while the least was 3.7% % for the household heads were aged over 50 years. Majority of the house hold heads were aged between 30 to 40 and 41 to 50 years. This is attributed to the fact that it is at this age that the people from the area of study are most sexually productive and taking family responsibilities.

4.3.3 Level of Education of the Household Heads

In this section the researcher sought to establish the level of education of the household heads. Their responses are highlighted in the Table 4.4.

Table 4.4: Level of Education of the Household Heads

Category	Frequency	Percentage
None	86	45.5
Primary school	49	26
Secondary school	36	19.0
Post-secondary education	18	9.5
Total	189	100

From the table 4.4, 45.5% of the household heads did not have any form of formal education, 25.9% of the household heads had their primary education, 19.0% % of the household heads had their secondary education and 9.5% of the household heads had their post-secondary education. Majority of the household heads are illiterate. This is attributed to their culture and shortage of schools where frequent migration in search of pasture hinders children from accessing education.

4.4 Mitigation of Disasters

The first objective assessed how disaster mitigation influenced household livelihood security in Laikipia North District, Laikipia County. Respondents were requested to indicate how they thought drought disaster affected their livelihood; effects of draught to them, access to information on weather forecasts, response to weather forecasts and whether disaster related infrastructure had been developed and rehabilitated in the last three years.

4.4.1 Effects of Drought Disaster on the Livelihood

In this section the researcher asked the household heads to indicate if they thought disaster affects their livelihoods. Their responses are shown in Table 4.5.

Table 4.5: Effects of Drought Disaster on the Livelihood

Category	Frequency	Percentage
Agree	87	46.0
Strongly agree	102	54.0
Disagree	0	0
Strongly disagree	0	0
Total	189	100

From the Table 4.5, all the respondents agreed that drought disaster did affect their livelihood from every sphere of their lives as shown in table 4.6. This is attributed to the forms of destruction that come with drought disasters. Previous studies indicate that drought disaster has had great negative impacts on people. In 2004/2006, drought affected 3.5 million people throughout Kenya and had had a negative impact on their lives. (Draft National Policy for Disaster Management, 2010)

4.4.2 Effects of Drought to the Pastoral Community

In this section the household heads were requested to indicate the effects of draught to their livelihoods. Their responses are shown in Table 4.6.

Table 4.6: Effects of Drought (n=189)

Category	Frequency	Percentage
Drying of water sources	180	17.7
Loss of livestock	180	17.7
Deterioration of human health	166	16.3
Deterioration of animal health	170	16.7
Increase in food prices	163	16.0
Decline in livestock prices	157	15.5

From Table 4.6, there were various effects of drought with 17.7% of the household heads indicating that the water sources dried up, 17.7% of the household heads indicated loss of livestock, 16.7% of the household heads indicated deterioration of animal health, 16.3% of

the household heads indicated deterioration of human health, 16.0% 16.3% of the household heads indicated increase in food prices and 15.5% 16.3% of the household heads indicated decline in livestock prices. Drought had a negative impact on all forms of livelihoods for pastoral communities studied. However, drying up of water sources and loss of livestock scored highest in terms of negative effects. Loss of human and animal lives, deterioration to their health is attributed to lack of enough and nutritious food. Previous studies indicate that when animals are weak, pastoralists struggle to keep the only strong animals to avoid loss, hence flooding of livestock market leading to a fluctuation in livestock prices. It's at this time that food crops like cereals get a high demand. While the supply was low, the prices shoot to a higher price compared to the normal situations.

4.4.3 Access to Information on Weather Forecast

In this section the respondents who are the household heads were asked to indicate how they accessed information on weather forecasts. Their responses are shown in Table 4.7. Below.

Table 4.7: Access to Information on Weather Forecast (n=189)

Category	Frequency	Percentage
Radio/TV	141	59.2
Extension agent	0	0
Meteorological department	6	2.5
Traditional sources	91	38.2

From the Table 4.7, Majority of the household heads indicated that they accessed information on weather forecasts from the radio/TV. There was however no record of extension agents from the region. Only 2.5 percent had access to meteorological services. Traditional sources like rainmakers in the society were also seen to be reliable to the community. This shows that at least all the respondents had access to information on the weather forecast one way or another. Previous studies indicate that information on weather is important as mitigation and preparation measure since the information collected has helped the communities prepare by putting in place contingency measures and plans in preparation for drought.

4.4.4 Response to Weather Forecast

In this section the researcher asked the household heads to indicate how often they responded to weather forecast. Their responses are shown in Table 4.8.

Table 4.8: Response to Weather Forecast

Category	Frequency	Percentage
Daily	23	12.2
Weekly	52	27.5
Monthly	0	0
Yearly	114	60.3
Total	189	100

From the Table 4.8, 60.3% of the household heads indicated that they responded to weather forecasts yearly, 27.5% of the household heads responded to weather forecasts weekly and 12.2% of the household heads responded to weather forecasts daily. Majority of the households responded to weather forecasts on a yearly basis. This is attributed to lack of accessibility to information and ignorance. The rate at which the respondents responded to weather forecast could not avert a disaster from happening. Previous studies indicate that timely technical information is needed to access the areas drought risk and timely response helps to save many lives. (UNISDR, 2009)

4.4.5 Disaster Related Infrastructure Developed and Rehabilitated

In this section the researcher asked the household heads to indicate what disaster related infrastructure had been developed and rehabilitated in the last three years. Their responses are shown in Table 4.9.below.

Table 4.9: Disaster Related Infrastructure that has been Developed and Rehabilitated (n=189)

Category	Frequency	Percentage
Dams	166	79.0
Boreholes	14	6.7
Rock catchment areas	23	11.0
Water pans	7	3.3

From the Table 4.9, 79.0% of the household heads indicated that the disaster related infrastructure had been developed and rehabilitated in the last three years was dams, 11.0% of the household heads indicated it was rock catmint, 6.7% of the household heads said it was boreholes and 3.3% of the household heads said it was water pans. This indicates that dams were the most frequently developed and rehabilitated form of water resource. This can be attributed to their cheap cost and ability to serve more people compared to the other resources. Previous studies indicate rehabilitation and development of infrastructure as very vital in assisting the communities resume or even better their livelihoods. Water points like dams, rivers, boreholes were key to pastoral households and failure to develop and rehabilitate them only increased the risk of disasters increasing vulnerability livelihood household insecurity.

4.4.6 Forms of Drought Risk Assessment Measures Undertaken

In this section the chiefs were the respondents and were requested to indicate the forms of drought risk assessment measures carried out in their location and those involved. In their response they indicated that having identified the major risk as drought, the community's capacity to cope with disasters still remained low. There lacked any formal form of hazard assessment because of lack of information. Assessment helps to understand the scale of the hazard, how it causes harm in order to help design mitigation measures.

4.4.7 Sufficiency of Public Awareness and Training Implemented to the Community

In this section the chiefs were asked to indicate how sufficient public awareness and training implemented was to the community. In their response they indicated it was low because of lack of partnership and funding for training and also traditional beliefs such as keeping more livestock as a sign of wealth. Training is one essential way of the capacity building within the

community. Previous studies indicate that lack of training has contributed to the failure to help individuals recognize and reduce risks within their localities. Without awareness and training, the communities continue to live with attitudes and behaviors that only contribute to their woes.

4.4.8 Infrastructure Development and Rehabilitation in Household Livelihood

In this section the researcher asked the chiefs to indicate of what influence infrastructure development and rehabilitation has on household livelihoods. In their response they indicated that rehabilitation of water resources was still minimal and the most common form of rehabilitation they got was for dams. However, they stated that the rehabilitation of dams had helped so much to reduce the disaster risk. The available dams provided water for humans and livestock and hence the cases where pastoralists lost animals to drought had sharply reduced in areas with these resources hence an enhancement of livelihood security among households.

4.4.9 Role Contingency Planning Plays in Mitigating Disasters

In this section the researchers asked the chiefs to indicate the role contingency planning played in mitigating disasters. In their response they indicated that early warning was given when pastoralists were advised to vaccinate, sell their livestock and keep the money that was used to buy food in the drought seasons and buy back livestock when the rainy season comes back.

4.4.10 Contingency Measures in Place to Lower the Risk of Disaster

In this section the researcher asked the chiefs to indicate the early warning systems in place, their importance and how best they could be utilized. In their response they indicated that the importance of early warning systems was that it reduced the death/loss of livestock and make the few remaining animals strong to survive. The most common contingency plan was vaccination of animals which was done with the assistance of the government through the veterinary department. Vaccination helped animals to remain immune to diseases whenever disasters stroke. It was very important as there were low numbers of animals lost.

4.5 Preparedness for Disaster

The first objective assessed how preparedness for disaster influenced household livelihood security in Laikipia North District, Laikipia County. The respondents were asked to indicate how they prepared themselves in readiness for drought disaster, their main source of water use for livestock, how respondents sought additional source of income during drought, where they reserved water during drought, if they reserved pasture during drought and the measures they put in place in case they were informed of an expected disaster.

4.5.1 How Household Heads prepare themselves in Readiness for Drought Disasters

In this section the researcher asked the household heads to indicate how they prepared themselves in readiness for drought disaster. Their responses are shown in Table 4.10.

Table 4.10: How Household Heads prepare themselves in Readiness for Drought Disasters

Category	Frequency	Percentage
Migration in search for pastures	154	61.6
Destocking	73	29.2
Livestock veterinary services	23	9.2

From the Table 4.10, 61.6% of the household heads indicated that they prepared themselves in readiness for drought disaster by migration in search for pastures, 29.2% of the household heads destocked and 9.2% of the household heads went for livestock veterinary services. Migration still remains the most popular way of the pastoral communities' way of preparing for disasters. This is much attributed to the traditions, culture and practice of the study community. Livestock veterinary services still remained minimal and were attributed to the area scope and lack of trained veterinaries from the area.

4.5.2 Main Source of Water for Use and for Livestock

In this section the researcher asked the household heads to indicate how they prepared themselves in readiness for drought disaster. Their responses are shown in Table 4.11.

Table 4.11: Main Source of Water for Use and for Livestock

Category	Frequency	Percentage
River/spring/stream	64	33.9
Water pans and dams	113	59.7
Wells and boreholes	6	3.2
Piped water	6	3.2
Total	189	100

From the Table 4.11, 59.7% of the household heads indicated their main source of water for use and for livestock was water pans and dams, 33.9% of the household heads indicated their main source of water for use and for livestock was rivers/springs/streams, 3.2% of the household heads indicated their main source of water for use and for livestock was wells and boreholes and 3.2% of the household heads indicated their main source of water for use and for livestock was piped water. The major source of water for pastoral communities was water pans and dams. This was attributed by the reason that most dams were constructed with the help of the government and being communal. Piped water is however very rare as most households can rarely afford them. Previous studies indicate that ease in access to water increases productivity since it saves time used by households taking the animals to dams and rivers to take water and hence improving the household livelihood security.

4.5.3 How Respondents Seek Additional Sources of Income in case of Drought

In this section the researcher asked the household heads to indicate how sought additional source of income in case of drought. Their responses are shown in Table 4.12.

Table 4.12: How Respondents Seek Additional Sources of Income in case of Drought

Category	Frequency	Percentage
Sale of assets	58	23.3
Seeking employment	77	30.9
Starting a business	114	45.8

From the Table 4.12, 45.8% of the household heads indicated that they sought additional sources of income in case of drought by starting up businesses, 30.9% of the household heads

sought employment and 23.3% of the household heads sold their assets. Small scale business is more popular than any other form of source of income. Though not popular with everyone, other sources of income help households make savings such that when disaster hits, the family will have some cash to buy food and sustain the family.

4.5.4 How Respondents Reserve Water for Use during the Drought

In this section the researcher asked the household heads to indicate how they reserved water for use during drought. Their responses are shown in Table 4.14.

Table 4.14: How Respondents Reserve Water for Use during the Drought

Category	Frequency	Percentage
Dams	136	71.9
Water pans	36	19.0
Tanks	3	1.6
Water bowsers	7	3.7
Boreholes	7	3.7
Total	189	100

From the Table 4.14, 71.9% of the household heads indicated that they reserved water for use during drought in dams, 19.0% of the household heads reserved water for use during drought in water pans, 3.7% of the household heads indicated they bought water from water bowsers, 3.7% of the household heads had dug boreholes and 1.6% of the household heads reserved water for use during drought in tanks. The dams remained the major sources since they were communal and rehabilitation and development was done by the community hence easy to sustain them. Tanks were not popular since many pastoralists rarely settle in one area and many could not afford to construct them.

4.5.5 How Often Respondents Reserve Pasture for Use during the Drought

In this section the researcher asked the household heads to indicate how often they reserved pasture for use during drought. Their responses were as shown in Table 4.15 below.

Table 4.15: How Often Respondents Reserve Pasture for Use during the Drought

Category	Frequency	Percentage
Always	24	12.7
Often	45	23.8
Rarely	105	55.6
Never	15	7.9
Total	189	100

From the Table 4.15, 55.6% of the household heads rarely reserved pasture for use during drought, 23.8% of the household heads often reserved pasture for use during drought, 12.7% of the household heads always reserved pasture for use during drought and 7.9% of the household heads never reserved pasture for use during drought.

4.5.6 Measures Put in Place in case of an Expected Disaster

In this section the researcher asked the household heads to indicate how the measures that were in place they are informed of an expected disaster. Their responses are shown in Table 4.16.

Table 4.16: Measures Put in Place in case of an Expected Disaster

Category	Frequency	Percentage
Destocking	126	35.0
Slaughter for consumption	61	16.9
Vaccination of animals	67	18.6
Alternative livelihoods	92	25.6
Emergency water services	14	3.9

From the Table 4.16, 35.0% of the household heads indicated that they would destock in case of an expected disaster, 25.6% of the households indicated they would look for alternative livelihoods in case of an expected disaster, 18.6% of the households indicated they would vaccinate animals in case of an expected disaster, 16.9% of the households indicated they

would slaughter for consumption in case of an expected disaster and 3.9% of the households indicated they would look for emergency water services in case of an expected disaster.

4.5.7 Reliability and Availability of the Major Food Sources during Drought

In this section the researcher asked the chiefs to indicate how reliable and available the major food sources in the markets are before and during the drought. In their response they indicated that before the drought, the people stocked foods such as maize flour and after the drought the people the market prices of the commodities reduced and people did not need to stock foods as such.

4.6 Response to Disaster

The first objective assessed how the response to disaster influenced household livelihood security in Laikipia North District, Laikipia County. The researcher asked the respondents to indicate what other livelihood options the household heads had apart from pastroalism when disaster strikes, main source of food for livestock during drought, kind of emergency relief support the get from government agencies when disaster strikes, relief support they get from advocacy agencies, disposal of livestock in case of disaster and forms of emergency water supply systems that are accessible during drought.

4.6.1 Measures Put in Place in case of an Expected Disaster

In this section the researcher asked the household heads to indicate the other livelihood options they had apart from pastorolism when disaster strikes. Their responses are shown in Table 4.17

Table 4.17: Measures Put in Place in case of an Expected Disaster

Category	Frequency	Percentage
Farming	13	6.9
Wage employment	58	30.7
Small scale business	118	62.4
Total	189	100

From Table 4.17, 62.4% of the household heads indicated that apart from pastoralism when disaster struck the other type of livelihood they were involved in was small scale business,

30.7% of the household heads indicated they were involved in wage employment and 6.9% of the household heads indicated they were involved in farming.

4.6.2 Main Source of Food for Livestock during Drought

In this section the researcher asked the household heads to indicate the main source of food for their livestock during drought. Their responses are shown in Table 4.18.

Table 4.18: Main Source of Food for Livestock during Drought

Category	Frequency	Percentage
Reserves	68	24.2
Buying hay from suppliers	55	19.5
Renting grazing land	20	7.1
Migrate livestock	138	49.1

From the Table 4.18, 19.0% of the household heads indicated their main source of food for their livestock was buying hay from suppliers, 49.1% of the household indicated in case of drought they migrated their livestock. 24.2% of the household heads indicated that they used reserves and 7.1% of the household heads indicated they use their reserve food.

4.6.3 Emergency Relief Support from Government Agencies

In this section the researcher asked the household heads to indicate the kind of emergency relief support they got from government agencies when disaster strikes. Their responses are shown in Table 4.18.

Table 4.18: Emergency Relief Support from Government Agencies

Category	Frequency	Percentage
Development aid	2	.6
Food relief supplies	168	54.2
Buying weak livestock	84	27.1
Cash for work programmes	40	12.9
Water tinkering	16	5.2
Animal forage	0	.0

From the Table 4.18, 54.2% of the household heads indicate the kind of emergency relief support they got from government agencies in times of disaster was food relief supplies. 27.1% of the household heads indicated they had the government buy their weak livestock, 12.9% of the household heads indicated they got cash for work programmes, 5.2% of the household heads indicated the government gave them water tinkering and 0.6% of the respondents indicated the government gave them development aid. No government aid was given in terms of animal forage. The provision of emergency relief is the major form of support provided for by the government. This is attributed by the reason the government has a responsibility to protect its citizens but always acts late when the disaster has hit.

4.6.4 Emergency Relief Support from Advocacy Agencies

In this section the researcher asked the household heads to indicate the kind of emergency relief support they got from advocacy agencies when disaster strikes. Their responses are shown in Table 4.19.

Table 4.19: Emergency Relief Support from Advocacy Agencies

Category	Frequency	Percentage
Development aid	8	3.7
Food relief supplies	98	44.7
Buying weak livestock	84	38.4
Cash for work programmes	16	7.3
Water tinkering	13	5.9
Animal forage	0	0

From the Table 4.19, 44.7% of the household heads indicated that the advocacy agencies gave relief support in terms of food relief supplies, 38.4% of the household heads indicated they got relied support by having their weak livestock bought, 7.3% of the household heads indicated they got cash for work programmes, 5.9% % of the household heads indicated the advocacy agencies gave them water tinkering and 3.7% of the respondents indicated the advocacy agencies gave them development aid. No aid was given in terms of animal forage. Food relief supplies were the major form of relief, like the government, this was attributed to late response by government to react to disasters thereby only providing food to save lives.

4.6.5 How Respondents Dispose of Livestock in case of Disaster

In this section the researcher asked the household heads to indicate how they disposed of their livestock in case of disaster. Their responses are shown in Table 4.20.

Table 4.20: How Respondents Dispose of Livestock in case of Disaster

Category	Frequency	Percentage
Destocking	107	35.3
Slaughtering	48	15.8
Sell commercially	148	48.8

From the Table 4.20, 48.8% of the household heads indicated that they disposed of the livestock in case of a disaster by selling them commercially, 35.3% of the household heads disposed of their livestock by destocking and 15.8% of the household heads indicated they

disposed of their livestock by slaughtering them. Most of the pastorolists sold their animals when disaster hit. This is attributed by the need to reduce loss and use the cash to buy cereals and other food.

4.6.6 Forms of Emergency Water Supply Systems Accessible during Drought

In this section the researcher asked the household heads to indicate the forms of emergency water supply systems accessible to them during drought. Their responses are shown in Table 4.21

Table 4.21: Forms of Emergency Water Supply Systems Accessible during Drought

Category	Frequency	Percentage
Water tinkering	123	65.1
Piped water	0	.0
Bore holes	54	28.6
Water bowsers	6	3.2
Dam water	6	3.2
Total	189	100

From Table 4.21, 65.1% of the household heads indicated the form of emergency water supply systems accessible to them during drought was water tinkering, 28.6% of the household heads indicated it was borehole water, 3.2% of the household heads indicated it was water bowsers, 3.2% of the household heads indicated it was dam water and none of the respondents indicated they got piped water. Water tinkering was very popular as it is a relief measure provided by the government as a relief measure though the ministry of water resources. Previous studies indicate that water tinkering is increasingly becoming a common method for delivering water during a drought emergency as in Ijara district being the perfect example. However the main challenge for this mode is failure by communities to have water tanks where the water can be stored. (Ministry of Water and Irrigation, 2005)

4.6.7 Animal Health Interventions

In this section the researcher asked the chiefs to explain how animal health interventions took place and the major challenges associated with them. In their response they indicated that the interventions took place rarely and just when there is an outbreak of animal diseases did the

government intervene. They also indicated that there was need to improve such interventions through training on health and drought and the effects of drought. Lack of animal health interventions increased the vulnerability of animals and whenever drought disaster strikes the weak animals could not resist the drought thereby lessening the ability of households.

4.6.7 Challenges that come with Emergency Water Supply Systems

In this section the researcher asked the chiefs to indicate the challenges that came along with emergency water supply systems meant for responding to disaster. In their response they noted that the water was salty mainly from wells which most times did cause diseases. At times it also took a lot of time for the government to respond. There only existed only one water tanker that served three districts in Laikipia County.

4.7 Reconstruction of to Disaster

The first objective assessed how reconstruction of disaster influences household livelihood security in Laikipia North District, Laikipia County. The researcher asked the respondents to indicate how often they participated in the maintenance of the water source, forms of contribution or participance provided to the community after disaster, who manages the water sources and measures put in place to safe guard themselves against future drought.

4.7.1 How Often Respondents Participated in the Maintenance of Water source

In this section the researcher asked the household heads to indicate how often they participated in the maintenance of water sources. Their responses were as shown in Table 4.22.

Table 4.22: How Often Respondents Participated in the Maintenance of Water source

Category	Frequency	Percentage
Always	46	24.3
Often	107	56.6
Rarely	34	18.0
Never	2	1.1
Total	189	100

From the Table 4.22, 56.6% of the household heads indicated they often participated in the maintenance of water sources, 18.0% of the household heads indicated they always participated in the maintenance of water sources, 24.3% of the household heads indicated they rarely participated in the maintenance of water sources and 1.1% of the household heads indicated they never participated in the maintenance of water sources. Previous studies indicate that participating in rehabilitation of water resources contributed to sustainability of the water sources.

4.7.2 Forms of Contribution or Participance Provided to the Community after Disaster

In this section the researcher asked the household heads to indicate the forms of contribution or participance provided to the community after a disaster. Their responses are shown in Table 4.23.

Table 4.23: Forms of Contribution or participance provided to the Community after Disaster

Category	Frequency	Percentage
Paying a fee	26	13.8
Provide labor	101	53.4
Offer skills	62	32.8
Total	189	100

From the Table 4.23, 53.4% of the household heads indicated that the forms of contribution or participance provided to the community after a disaster was through providing labor, 32.8% of the household heads indicated it was through offering skills and 13.8% of the household heads indicated it was through paying a fee. Many of the household's preferred to offer labor since it is the simplest and most available way of participance. Participance also ensured ownership of resources and increasing sustainability.

4.7.3 Management of Water Sources

In this section the researcher asked the household heads to indicate who managed water sources. Their responses are shown in Table 4.24.

Table 4.24: Management of Water Sources

Category	Frequency	Percentage
Individual owners	0	.0
Community	175	85.7
Organization/ranches	14	7.4
Total	189	100

From the Table 4.24, 85.7% of the household heads indicated that the water sources were managed by the community, 7.4% of the household heads indicated that the water sources were managed by the organization/ranches and interestingly none of the water sources was managed by the individual owners. From the findings the majority of the water resources are community owned. This can be attributed to the reason because many institutions prefer to assist groups rather individuals explaining the results above.

4.7.4 Measures Put in Place to Safeguard against Future Drought

In this section the researcher asked the household heads to indicate the measure that have been put in place to safeguard themselves against future drought. Their responses are shown in Table 4.25.

Table 4.25: Measures Put in Place to Safeguard against Future Drought

Category	Frequency	Percentage
Migration	52	17.0
Livestock diversification	46	15.1
Alternative livelihoods	129	42.3
Savings	78	25.6

From the Table 4.25, 42.3% of the household heads indicated that the measures they had put in place to safeguard themselves against future drought was having alternative livelihood, 25.6% of the household heads saved as a way of protecting themselves against future drought and 17.0% of the household heads used migration as a way of protecting themselves against future drought. Most of the households preferred to be involved in alternative livelihoods to safeguard themselves against future droughts. Earlier studies indicate that alternative

livelihoods like practicing agriculture and small businesses were important sources of income during and in preparation for disasters.

4.8 Disaster Risk Reduction

In this section the researcher sought from the chiefs the support and role their position played in disaster risk reduction, disaster risk related challenges, forms of damages influenced by drought disaster risks and the estimate number of households severely affected by drought.

4.8.1 Role and Support the Chiefs play in Disaster Risk Reduction

In this section the researcher asked the chiefs to indicate the role and support their position played in disaster risk reduction. The respondents indicated that they educated community members about the prevention of disaster. They also played a part as being the link between the people and the government at the grassroots. In this position they co-ordinate and mobilized the community in articulating government policies and in most times the contingency plans to avert disaster. Chiefs were also heavily important during emergency disaster relief by co-coordinating the distribution of relief food.

4.8.2 Disaster Related Challenges Encountered in their Role

In this section the researcher asked the local chiefs to indicate their disaster related challenges they encountered in their role as chiefs. The respondents indicated they were challenged by fire disasters, drought disasters and disease disasters. However drought remained the major challenge to the community and it affected livelihoods in the biggest way by loss of livestock which is their main source of living and wealth.

4.8.3 Key Forms of Damages Influenced by Drought Disaster Risks in the Location

In this section the researcher asked the chiefs to indicate the key forms of damages influenced by drought disaster risks in their location. The respondents indicated that the key damages were death of livestock and sometimes death of people. Hiking of food prices was also common in the areas. Drought also contributed to health deterioration rendering the community unproductive.

4.8.4 Estimated Number of Households Severely Affected by Drought

In this section the researcher asked the respondents to indicate the estimated number of households severely affected by drought. The respondents indicated that on average 75% of

female headed households were affected, 5% people living with disabilities were affected, 95% of households practicing pastoralism were affected, 2% of agro pastoralists' households were affected and 98% of the schools going children were affected. Female headed households were highly affected because of the defined gender roles and culture within the community. Women are seen as part of one's children in the Maasai culture and hence are not allowed to own cattle and hence when disaster strikes, they are the most hit.

CHAPTER FIVE

SUMMARY, DISCUSSIONS, CONCLUSIONS AND RECOMMEDATIONS

5.1 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings highlighted and recommendations made. The conclusions and recommendations drawn were focused on addressing the purpose of the study which was to investigate the community based disaster risk reduction in enhancement of household livelihood security in Laikipia North District, Laikipia County. The summary of the findings are based on the objectives of the study.

5.2 Summary of Findings

The researcher started by looking at how disaster mitigation influences household livelihood security in Laikipia North District, Laikipia County and the findings from the study showed that drought disaster did affect the livelihoods of the community members with 17.7% of the household heads indicating that the water sources dried up, 17.7% of the household heads lost livestock, 16.7% of the household heads indicated deterioration of animal health, 16.3% of the household heads indicated deterioration of human health, 16.0% of the household heads indicated increase in food prices and 15.5% 16.3% of the household heads indicated decline in livestock prices. 59.2% of the household heads indicated that they accessed information on weather forecasts from the radio/TV indicating the rate at which the respondents responded to weather forecast could not avert a disaster from happening. 79.0% of the household heads indicated that the disaster related infrastructure had been developed and rehabilitated in the last three years was dams, 11.0% of the household heads indicated it was rock catchments, 6.7% of the household heads said it was boreholes and 3.3% of the household heads said it was water pans. This means that dams were developed and rehabilitated frequently more than any other water infrastructure and helped improve and the chances of a disaster risk.

The second objective assessed how preparedness for disaster influences household livelihood security in Laikipia North District, Laikipia County and the findings of the study showed that 61.6% of the household heads indicated that they prepared themselves in readiness for drought disaster by migration in search for pastures, 59.8% of the household heads indicated their main source of water for use and for livestock was water pans and dams, 45.8% of the household heads indicated that they sought additional sources of income in case of drought

by starting up businesses, 71.9% of the household heads indicated that they reserved water for use during drought in dams, 55.6% of the household heads rarely reserved pasture for use during drought and 35.0% of the household heads indicated that they would destock in case of an expected disaster, 25.6% of the households indicated they would look for alternative livelihoods in case of an expected disaster, 18.6% of the households indicated they would vaccinate animals in case of an expected disaster, 16.9% of the households indicated they would slaughter for consumption in case of an expected disaster and 3.9% of the households indicated they would look for emergency water services in case of an expected disaster.

Objective three assessed how response to disaster influences household livelihood security in Laikipia North District, Laikipia County and the findings of the study showed that 62.4% of the household heads indicated that apart from pastoralism when disaster struck the other type of livelihood they were involved in was small scale business, 49.1.0% of the household heads indicated their main source of food for their livestock was migrating animals to other areas for pasture when disasters hit, 54.2% and 44.7% of the household heads indicate the kind of emergency relief support they got from government agencies and advocacy agencies respectively when disaster strikes was food relief supplies. 48.8% of the household heads indicated that they disposed of the livestock in case of a disaster by selling them commercially, 65.1% of the household heads indicated the forms of emergency water supply systems accessible to them during drought was water tinkering, 28.6% of the household heads indicated it was borehole water, 3.2% of the household heads indicated it was water bowsers, 3.2% of the household heads indicated it was dam water and none of the respondents indicated they got piped water.

The last objective assessed how reconstruction or recovery from disasters influenced household livelihood security in Laikipia North District, Laikipia County. The findings from the study showed that 56.6% of the household heads indicated they often participated in the maintenance of water sources, 53.4% of the household heads indicated that the forms of contribution or participance provided to the community after a disaster was through provision of labor, 42.3% of the household heads indicated that the measures they had put in place to safeguard themselves against future drought was having alternative livelihood, and 85.7% of the household heads indicated that the water sources were managed by the community, 7.4% of the household heads indicated that the water sources were managed by the

organization/ranches and interestingly none of the water sources was managed by the individual owners.

5.3 Discussions

The researcher started by looking at how disaster mitigation influences household livelihood security in Laikipia North District, Laikipia County. It was noted that as much as there was easy access to information on weather forecast, most of the community members did not respond to what was said about the weather and this clearly shows the rate at which the community responded to weather forecast could not avert a disaster from happening. To mitigate disaster a lot of effort had been done to develop and rehabilitate especially dams that were used as water reservoirs such that during drought the water would be enough to sustain the community. Due to overuse during drought, most of the dams were rendered dry and the households had to look for other options. However much more needs to be done on other water sources that aren't developed or need to be rehabilitated. The region lacked boreholes and this would help to distribute water through pipes closer to the communities and hence increase production by the households through time saving; hence contributing to improved household livelihoods. Mitigation plans need to be put in place in the forms of contingency plans, training and awareness on how to handle disasters whenever they come. With this knowledge, the community will have been empowered to handle the disaster and such that the losses that are attributed to disasters will be minimal and the effect will not affect those in the community.

The second objective was to assess how preparedness for disasters influenced household livelihood security in Laikipia North District, Laikipia County. It was noted that the community members prepared themselves in readiness for disaster by constantly migrating in search of pastures and water and destocking. In addition to this, they also sought additional income in case of drought from sales of assets; small scale business and seeking employment so that they can get income to at least buy food for consumption. They reserved water for use during drought mainly in dams and water pans. Tanks and water bowsers were also used but not commonly given that most of the community members were pastoralists who migrated time and again. They rarely reserved pastures for use during drought and the measures they put in place in case of a disaster was mainly destocking which is a temporary solution to the problem. From the study, there is need for much more in terms of preparation in this district. The need for strategic stock piling of cereals and grains is important so that whenever drought comes, food prices will not hike by a great margin. Livestock marketing is another

measure that should be enhanced since livestock can be able to fetch high prices before the drought comes and the money the pastoralists get can be used to buy food and savings so that after the drought, the pastoralists will be able to restock their animals. Animal and human health is very critical at this stage. During the preparation stage much need to be done on vaccination since by doing so, many people and animals are able to withstand the drought. Lack of vaccination services is a major contribution to large number of losses in livestock because many animals are vulnerable to diseases and when disaster strikes not many survive. This affects the households whose main source of livelihood is livestock and livestock products.

The third objective assessed how response to disaster influenced household livelihood security in Laikipia North District, Laikipia County. It was noted that the other source of livelihood for the community other than pastoralism was small scale businesses mainly sell of curios and charcoal at the roadside so that they can get income. The main source of food for their livestock on the other hand during drought was migrating livestock to neighboring districts clearly showing that they hardly kept any reserves. The emergency relief support they were given by government and advocacy agencies was mainly food relief supplies and failed short of providing them with a permanent solution. There is need for introduction of supplementary feeding for vulnerable groups so as to salvage most of the weak ones. Emergency water supply systems should be enhanced by building water tanks. Water tanks are necessary since they will be able to hold water brought in through water tinkering services. Human and animal health interventions are rare and there is need to provide for these services to enhance productivity and strengthen the affected groups.

Finally the last research question looked at how reconstruction of disaster influenced household livelihood security in Laikipia North District, Laikipia County. It was noted that the community members often participated in reconstruction of disaster by contributing or participating in paying a fee, providing labor and offering skills. Participation is very essential as it contributes to the sustainability and ownership of the water resources by the community. However cash for work programme was still not popular in the area. This is a programme where institutions set up programmes but rather than getting labor elsewhere, they use the available labor from the community and those who participate are paid. This provides an alternative to the households who only rely on pastoralism as their only means of livelihoods. By using this alternative, households get another source of livelihood which helps them make enough savings such that disasters hit, there is no major negative effects to the households' in terms of their livelihood security. Natural resources should be managed in

a clear manner so that there will be no overuse of the available resources like water and rangelands. Proper management is essential in the future as the community can harvest excess pasture and store it for the future.

5.4 Conclusions

Based on the above findings, the researcher concludes that indeed drought disasters affect the livelihood of the community in various aspects such as drying of water sources, loss of livestock, deterioration of human and animal health, increase in food prices and decline in livestock prices. These effects only contribute to deterioration of household's livelihood security. Community members were not adequately prepared to ward off disaster given the fact that they are pastoralists. The community members did not have a strong response to disaster mechanism and during severe drought they were practically reduced to begging for relief food. The study finally concludes that the reconstruction of disaster strategies put in place was noted not to have a long term solution to the drought menace as they weren't solid enough.

5.5 Recommendation

In light of the above findings, the researcher recommends that weather forecast information should be broadcasted through all local channels in the local languages if need be in a bid to avert draught disasters and the government should develop and rehabilitate disaster related infrastructure constantly to avoid drought calamities.

The study also recommends that there should campaign held if need be door to door campaigns to prepare and make aware the community members on how to avert drought. They need to be taught on how to preserve water, pastures, destock when necessary look for alternative sources of livelihood in a void drought disasters. They should also be trained to adapt to other livelihoods that are not severely affected by droughts.

There is need for employment of extension agents to advise the community when disasters are about to hit. Metrological department needs to establish a centre within the area so as the community can have access to early warning signals.

The study recommends that the government and advocacy agencies should intensify emergency relief support not only in terms of food relief but also through development aid of things such as provision of draught resistant seeds and crops, construction of dams, boreholes and putting up tanks for them, train and educate them how to rehabilitate their lands instead of relying heavily on pastoralism. They should also be enlightened to go about agro-

pastralism and foresting their range lands. The government should also introduce contingency plans and policies to help the communities mitigate and prepare for disasters.

The study recommends an introduction of cash for work programme to the community which will help the community use their available resources in terms of human labor to help in developing, maintaining and sustaining of available disaster mitigating infrastructure like dams. This will encourage participation and sustainability of the projects.

Finally the study recommends that all the community members in conjunction with other stakeholders should be actively involved in the reconstruction of disaster and put in place measures that can effectively obviate disaster. Participation is very vital in sustainability of community projects and the more sustainable the resources are, the lower the risks of disasters. There is need top

5.6 Areas for Further Study

The study recommends that more research needs to be done on the

1. How training on community based disaster reduction can be used in the enhancement of the household livelihood security.
2. The role of culture and gender roles in limiting community based disaster risk reduction.
3. The role of alternative livelihoods in community based disaster risk reduction.

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APPENDICES

Appendix 1; Letter of Introduction for Household Heads.

ANTHONY KIHURO MWANGI
P.O. BOX 378
NANYUKI

TO……

……..

Dear sir/ madam.

RE: Letter of introduction to carry out Academic Research

I am a student of University of Nairobi pursuing a Masters Degree in Project Planning and Management. I am undertaking an academic study on Community Based Disaster Risk Reduction in Enhancing Household Livelihood Security in Laikipia North District.

In view of this your household has been identified to participate in providing the necessary information as regards this study. The study in particular will be addressing issues of disaster mitigation, preparedness, response and recovery from disasters. I therefore kindly request you to fill this questionnaire as accurate as possible to ensure the study achieves its intended objective. The information that you will give is confidential and will be used only for the purpose of academic purpose. Thank you.

Yours faithfully,

KIHURO MWANGI
L50/74546/2012

Appendix 2: Questionnaire for Household heads

A survey questionnaire on Community Based Disaster Reduction in the Enhancement of Household Livelihood Security in Laikipia North District, Laikipia County.

Instructions

This questionnaire is purely designed for academic purposes. The information given by any respondent will be kept confidential and will not be used for any other purposes without the consent of the respondent. You are not required to indicate you name on the questionnaire. Kindly use tick (√) inside the box to indicate the correct answer where choices are given. Write your answer in the spaces provided where choices are not given.

General information

1. Sex of respondent

Male { } Female { }

2. Geographical location

Division…….Location……..

Sub-location ……..

3. Age in years

Under 30 years { }

30-40 { }

40-50 { }

Over 40 years { }

4. Level of education of household head

None { } Primary school { } Secondary school { }

Post secondary school { }

Part 2. Mitigation of disasters

5. What is your perception to draught?

……

……

6. Do you think drought disaster affect your livelihood?

Agree { } strongly agree { } Disagree { } strongly disagree { }

7. What are the effects of draught?

Drying of water sources { } Loss of livestock { }

Deterioration of human health { } Deterioration in animal health { }

Increase in food prices { } Decline in livestock prices { }

8. How do you access information on weather forecasts?

   Radio/TV { } Extension agent { } Meteorological department { }

   Traditional sources { }

9. How often do you respond to weather forecasts?

   Daily { } Weekly { } Monthly { } Yearly { }

10. Explain and specify any form of disaster risk reduction training any member of your household undertaken.

    …….

11. What disaster related infrastructure has been developed and rehabilitated in the last 3 years? (Specify if rehabilitated)

    Dams { } Boreholes { } Rock catchment areas { } water pans { }

Part 3. Preparedness for Disasters

12. How do you prepare yourself in readiness for drought disaster

    Migration in search for pastures { } Destocking { }

    Livestock veterinary services { }

13. What is your main source of water for use and for livestock?

    River/spring/stream { } Water pans and dams { } Wells and boreholes { }

    Piped water { }

14. How do you seek additional sources of income in case of drought?

    Sale of assets { } Seeking employment { } Starting a business { }

    Other (specify) { }

15. How do you reserve water for use during the drought?

    Dams { } Water pans { } Tanks

    Other (specify)…….

16. Do you reserve pasture for use during the drought?

    Always { } Often { } Rarely { } Never { }

17. What measures do you put in place in case you are informed of an expected disaster?

    Destocking { } Slaughter for consumption { }

    Vaccination of animals { } Alternative livelihoods { }

    Emergency water services { }

Part 4 Response to disasters

18. What other livelihood option do you have apart from pastoralism when disasters strike?

    Farming { } Wage employment { } Small scale business { }

19. What is your main source of food for your livestock during drought??

    Reserves { } Buying hay from suppliers { }

    Renting grazing land { } Migrate livestock { }

20. What kind of Emergency relief support do you get from Government agencies do you get when disaster strikes?

    Development aid { } Food relief supplies { } Buying of weak livestock

    Cash for work programmes { } water tinkering { } animal forage { }

    Other (specify)……..

21. What kind of relief support do you get from Advocacy agencies?

    Development aid { } Food relief supplies { } Buying of weak livestock

    Cash for work programmes { } water tinkering { } animal forage { }

    Other (specify)……..

22. How do you dispose your livestock in case of disasters?

    Destocking { } Slaughtering { } Sell commercially { }

23. What forms of emergency water supply systems are accessible to you during drought?

    Water tinkering { } Piped water { }Other (specify) ……

Part 5. Reconstruction of disasters

24. How often do you participate in the maintenance of the water source?

    Always { } Often { } Rarely { } Never { }

25. What form of contribution or participance do you provide to the community after a disaster?

    Paying a fee { } Provide labor { } Offer skills { } Other (specify) …….

26. Who manages the water sources?

    Individual owners { } Community { } Organization/ranches { }

    Other (specify) ……..

27. What measures do you put in place to safeguard yourself against future drought?

    Migration { } Livestock diversification { } Alternative livelihoods { }

    Savings { } Other (specify)…….

Appendix 3; Key Informants Interview Guide for Area Chiefs

Instructions

Kindly use tick (√) inside the box to indicate the correct answer where choices are given. Write your answer in the spaces provided where choices are not given.

Section 1: Disaster Risk Reduction

1. What role and support does your position play in disaster risk reduction?

   ……

   ……..

2. What disaster risk related challenges do you encounter in this role?

   .....

   .....

3. In your opinion what are the key forms of damages influenced by drought disaster risks in your location?

   ……

   ……

4. Please give an Estimation of number (percentage) of households severely affected by drought.

   a. Female headed households …….....

   b. Households with people living with disabilities……

   c. Households practicing pastoralists …….

   d. Agro pastoralists households …….

   e. School going children …….

SECTION 2; Mitigation of Disasters

5 Risk assessment, public awareness and training, infrastructure development and rehabilitation, contingency planning, early warning systems.

a) Explain the forms of Drought risk assessment measures carried out in your location and those involved.

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b) In your own opinion, how sufficient is public awareness and training implemented to the community?

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c) Based on your opinion, of what influence does infrastructure development and rehabilitation have in house hold livelihoods?

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d) In your opinion what role does Contingency planning play in mitigating disasters?

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f. Explain the contingency measures in place and the ones needed to lower the risk of disaster.

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e) Explain the forms of early warning systems in place, their importance and how best they can be utilized.

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Section 3; Disaster Preparedness

6 Stock piling of cereals and grains, rehabilitation of water points, livestock marketing, animal health.

a. In your own opinion, how reliable and available are the major food sources in the markets before and during the drought.

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b. Describe the sources or supply of cereals and legumes for household food stocks.

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c. In your own opinion explain the process of Development and rehabilitation of critical water points within your location.

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d. Describe the role of Livestock markets and the marketing procedure within your location.

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e. Explain the role played by holding areas and their influence on household livelihoods within your location.

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Section 4: Response to Disasters.

a. In your own opinion explain how animal health interventions take place and the major challenges associated with them.

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b. What are the available and affordable human health interventions within the location, and how can they be improved.

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c. In your opinion, what challenges come with emergency water supply systems meant for responding to disasters.

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d. Please define is the process of supplementary feeding for vulnerable groups in your location?

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Section 5: Disaster Recovery

Impact of disaster recovery and reconstruction on household livelihood; Restocking, rehabilitation of critical water points, infrastructural development, cash for work, and natural resources management interventions.

a. Explain the process of restocking after drought disasters?

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b. In your own opinion, explain the forms of cash for work programmes within your location, participance and agencies involved in the same.

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c. Explain the natural resources management interventions in place within your location and how they work and the challenges they face.

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d. Please explain the process of infrastructure development after drought disaster and the infrastructure that has been established after drought to counter the risk later on.

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e. In your opinion explain the process of rehabilitation of critical water points damaged by disasters and the involvement of the community in the same.

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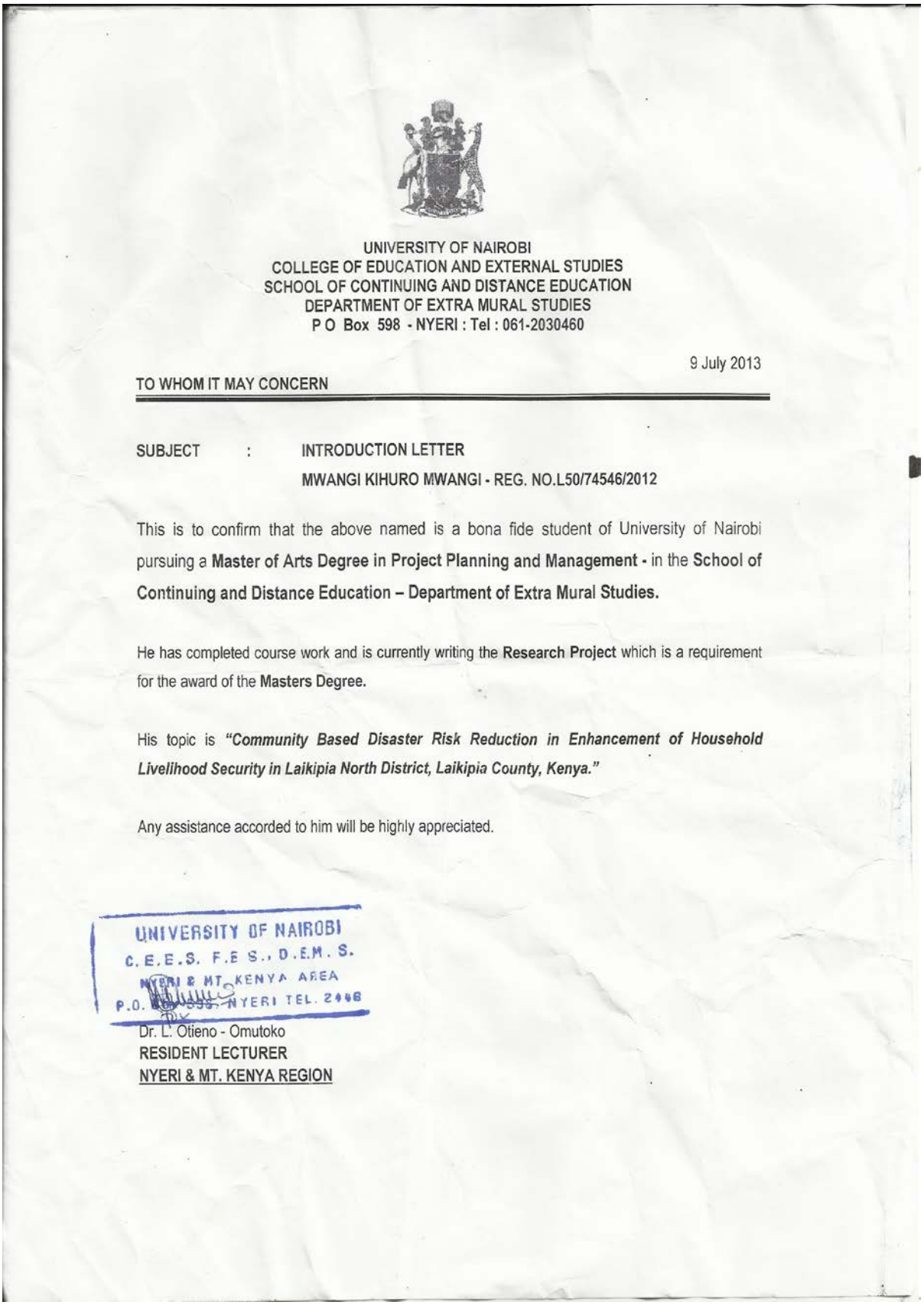
Appendix 4; Introduction Letter, University of Nairobi



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA MURAL STUDIES
P O Box 598 - NYERI : Tel : 061-2030460

9 July 2013

TO WHOM IT MAY CONCERN

SUBJECT : INTRODUCTION LETTER
MWANGI KIHURO MWANGI - REG. NO.L50/74546/2012

This is to confirm that the above named is a bona fide student of University of Nairobi pursuing a **Master of Arts Degree in Project Planning and Management** - in the **School of Continuing and Distance Education – Department of Extra Mural Studies.**

He has completed course work and is currently writing the **Research Project** which is a requirement for the award of the **Masters Degree.**

His topic is ***"Community Based Disaster Risk Reduction in Enhancement of Household Livelihood Security in Laikipia North District, Laikipia County, Kenya."***

Any assistance accorded to him will be highly appreciated.

UNIVERSITY OF NAIROBI
C.E.E.S. F.E.S., D.E.M.S.
NYERI & MT. KENYA AREA
P.O. BOX 598 - NYERI TEL. 2468

Dr. L. Otieno - Omutoko
RESIDENT LECTURER
NYERI & MT. KENYA REGION

Appendix 5; Research Permit,

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: NCST/RCD/14/013/1286

Date: 16th July 2013

Anthony Kihuro Mwangi
University of Nairobi
P.O. Box 598
Nyeri.

RE: RESEARCH AUTHORIZATION

Following your application dated **11th July, 2013** for authority to carry out research on ***"Community based disaster risk reduction in enhancement of household livelihood security in Laikipia North District, Laikipia County, Kenya."*** I am pleased to inform you that you have been authorized to undertake research in **Teso North District** for a period ending **30th September, 2013.**

You are advised to report to **the District Commissioner and District Education Officer, Laikipia North District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioner
The District Education Officer
Laikipia North District.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".