ASSESSING THE SOCIO-ECONOMIC EFFECTS OF FLOODS IN THE HOUSEHOLDS OF NYATIKE DIVISION IN MIGORI COUNTY- KENYA

BY

HERINE AKINYI OWUONDA

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Submitted by

Herine Akinyi Owuonda

This dissertation is submitted in partial fulfilment of the requirements for the award for the degree of Master of Development Studies (MDS) from St Paul's University, Limuru.

Supervisors: Mr. Antony Odek
Dr. Vundi Nason

September, 2016

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DECLARATION

This dissertation is a product of my own work and is not the result of anything done in collaboration. It has not been previously presented to any other institution. I agree that this dissertation may be available for reference and photocopying at the discretion of the University.

NAME OF THE STUDENT: Herine Akinyi Owuonda: STUDENT NO: MDS/NRB/8596/14

SIGNATURE OF STUDENT----------DATE----------

We confirm that the work reported in this thesis has been done by the student under our supervision.

NAME OF THE SUPERVISOR----------

SIGNATURE OF SUPERVISOR----------DATE----------

NAME OF THE SUPERVISOR----------

SIGNATURE OF SUPERVISOR----------DATE----------

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DEDICATION

This work is dedicated to my brothers, Pastor Caleb Owuonda and Rev. Wilson Owuonda for their continued encouragement and support in my path of education.

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During the process of acquiring education we may encounter different people who play different roles in one's life. I do wish to express my sincere appreciation to various people who have contributed to my education's success. In a special way, I thank my late parents Mrs. Wilkista Owuonda and Josphat Owuonda who introduced me to education and schooling.

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ABSTRACT

Flood is one of the worst natural disasters worldwide. This study aimed at examining the socio-economic effects of floods in Nyatike Division, Migori County. Specific objectives of the study were to: examine effects of floods on the family ties in Nyatike Division, Migori County, determine effects of floods on the health of people of Nyatike Division, establish effects of floods on household property in Nyatike Division, and assess coping strategies used by households in response to floods.The study relied on descriptive case study survey design and data collected mainly through questionnaires and interview schedule. Sampling was done using mainly simple random and purposive designs. Simple random sampling was used to select the target households whereas purposive sampling techniques were employed to select key informants such as Government officials, NGOs working in the area and health officers were selected purposively. The study findings revealed that floods impacted negatively on people's socioeconomic livelihoods on various aspects such as health, housing, social asset and property among others. The study further revealed that households employed various strategies to prevent and deal with the effects of floods. Digging trenches was found to be the most common way of dealing with and preventing adverse effects of floods. The research findings also demonstrate that most households depend on aids from the Government and NGOs as a method of dealing with effects of floods. Decisions about ways of dealing with floods are made by husbands. The study recommends that the Government should consider construction of dams to trap the excess water from river Kuja and Migori. This could be used for irrigation to improve food production in the area. The study also calls for proper preparedness and a long term solutions to dealing with floods in the area. The conclusion from this study is that floods in Nyatike division impact on households negatively

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TABLE OF CONTENTS

DECLARATION iii
DEDICATION iv
ACKNOWLEDGEMENT v
ABSTRACT vi
TABLE OF CONTENTS vii
LIST OF TABLES x
LIST OF FIGURES xi
LIST OF ABBREVIATIONS xii

CHAPTER ONE 1
INTRODUCTION 1
1.1. Background of the Study 1
1.2. Problem Statement 3
1.3. Objectives of the Study 4
1.4. Research Questions 4
1.5. Justification and Significance of the Study 4
1.6. Scope of the Study 5
1.7. Limitation and De-limitations of the Study 5
1.8. Definition of Terms 5

CHAPTER TWO 7
THEORETICAL AND EMPERICAL LITERATURE REVIEW 7
2.1. Introduction 7
2.2. Review of Key Concepts 7
2.2.1 Floods 7
2.2.2 Coping Strategy/Mechanism 10
2.3. Historical Background of Major Floods in Kenya 10
2.4. Vulnerability to Floods 11
2.5. Review of Empirical Studies 15
2.6. Socioeconomic Effects of Floods 20
2.6.1. The impacts of flooding events on the Family Ties 22
2.6.2. Flooding and its Health Related Effects 22
2.6.3. Effects of Floods on Household Property 24
2.6.4. Impacts of floods on Livestock/Crops 26
2.7. The socio-economics of coping strategies 27
2.7.1. Coping strategies and the household's well-being 27
2.8. Theoretical and Conceptual Frame-works 28
2.8.1. Theoretical Framework 28
2.8.2. Conceptual Framework 29
2.9. Research Gaps 30

ST. PAUL'S UNIVERSITY

CHAPTER THREE 32
RESEARCH METHODOLOGY 32
3.1. Introduction 32
3.2. Research Design 32
3.3. Study Area 33
3.4. Target Population 33
3.5. Data Sources 33
3.6. Sampling Procedure and Size 34
3.6.1. Sampling procedure 34
3.6.2. Sample size 34
3.7. Research instruments 35
3.7.1. Questionnaires 35
3.7.2. Key Informant Interviews (KIIs) 36
3.8. Validity and Reliability 36
3.9. Data Analysis and Presentation of Findings 37

CHAPTER FOUR 38
STUDY FINDINGS AND DISCUSSIONS 38
4.1. Introduction 38
4.2. Demographics 38
4.2.1. Gender of Respondents 38
4.2.2. Age of the respondents 39
4.2.3. Marital Status 39
4.2.4. Level of Education 40
4.2.5. Main Occupation and Monthly Income 41
4.2.6. Monthly Income 42
4.2.7. Length of Residency 43
4.4. Effects of floods on the family ties in Nyatike Division, Migori County 43
4.4.1. Floods and Relocation 44
4.4.2. Floods and Family Ties 44
4.5. Effects of floods on the health of people of Nyatike Division, Migori County ... 46
4.5.1. Health facilities 46
4.5.2. Disruption to health facilities 47
4.5.3. Sickness among household members 47
4.5.4. Common diseases among household members during the floods 48
4.6. Effects of floods on household property in Nyatike Division, Migori County 49
4.6.1. Damage to household Properties 49
4.6.2. Extent of damage 50
4.6.3. Damage to houses 51
4.6.4. Types of household properties destroyed during floods 52
4.7.1. Coping with effect of floods 53
4.7.2. Dealing with effects of floods 54
4.7.3. Decision making in dealing with floods 54

ST. PAUL'S UNIVERSITY

CHAPTER FIVE **56**
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS **56**
5.1. Introduction 56
5.2. Summary of Key Findings 56
5.2.1. Socioeconomic Characteristics 56
5.2.2. Effects of floods on the family ties in Nyatike Division, Migori County 56
5.2.3. Effects of floods on the health of people of Nyatike Division, Migori County ... 57
5.2.4. Effects of floods on household property in Nyatike Division, Migori County 57
5.2.5. Coping strategies used by the households in response to floods in Nyatike Division, Migori County 57
5.3. Conclusions 58
5.3. Recommendations 58
5.4. Suggestion for Further Research 59

REFERENCES **60**

APPENDICES **70**
Appendix 1. Household Questionnaire 70
Appendix 2. Interview Guide for Key Respondents 76

ST. PAUL'S UNIVERSITY

LIST OF TABLES

Table 3.1. Response Rate 35
Table 4.1. Distribution of Respondents according to their Age Brackets 39
Table 4.2. Levels of education 40
Table 4.3. Distribution of Sources of Income (Occupations) 41
Table 4.4. Distribution of respondents according to their length of residency 43
Table 4.5. Whether floods affect family ties 45
Table 4.6. Distribution of responses on the distribution of health facilities in the area 47
Table 4.7. Whether any household member got sick during floods 47
Table 4.8. Response on whether there was any damage to household properties 49
Table 4.9. Most Commonly used methods of dealing with effects of floods 54

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LIST OF FIGURES

Figure 2.1. A conceptual framework showing the relationship between the floods and Socio-economic Effects on Households 29
Figure 4.1. Gender Distribution of Respondents 38
Figure 4.2. Marital Status 39
Figure 4.3. Levels of Monthly Income 42
Figure 4.4. Whether respondents were forced to relocate to safer areas during floods 44
Figure 4.5. Whether there are health facilities in the area 46
Figure 4.6. Common diseases among household members 48
Figure 4.7. Extent of damage to household properties 50
Figure 4.8. Destruction of houses in the study area 51
Figure 4.9. Forms of Household Assets destroyed during floods 52
Figure 4.10. Different ways of preventing adverse effects of floods in the area 53
Figure 4.11. Members of household mostly responsible for any decision about dealing with floods 54

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LIST OF ABBREVIATIONS

CRED	Centre for Research on the Epidemiology of Disasters
EU	European Union
HH	Household
IUCN	International Union for Conservation of Nature
KIRA	Kenya Initial Rapid Assessment
SPSS	Statistical Package of Social Sciences
UNDP	United Nations Development Program
WHO	World Health Organisation

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CHAPTER ONE
INTRODUCTION

1.1. Background of the Study

Flooding, defined as inundations of flood plains following excessive flow of water from rivers or streams, is one of the worst natural phenomenon associated with destructive events affecting livelihoods, environments, organisations, and economies worldwide (Amparado *et al.,* 2014). Flooding is generally a product of rivers which usually burst their banks and submerge the neighboring farms and houses leading to displacement of people and destruction of properties. Floods are one of the chief causes of disaster related deaths across the world (Jonkman & Kelman, 2005). It is approximated that 6.8 million lost their lives as a result of floods in the 20th century (Amparado *et al.,* 2014). EM-DAT data (quoted in CRED, 2015, p.7) discloses that flooding was responsible for most of disasters between the years 1994 to 2013, estimated at 44 % or 2.5 billion people internationally. It is projected that by 2030, the effects of floods would be worse worldwide due to rapid urbanization which may double people's vulnerabilities to dangers of floods (Lehmann, 2015).

Developing countries have not been spared by floods which have been increasing not only in terms of frequency but also severity (Von Braun Vlek, & Wimmer, 2002). Asia and Africa remains the most flood risk continent and accounted for about half of all destructions as experienced in late 20thcentury(Jonkman, 2005). However, there have been increasing dangers in other regions. For instance, in South America, floods affected about half a million in 1994 to 2003 but by 2013, the people affected had increased to 2million (Lehmann, 2015).

Like the rest of the world, floods have affected East African countries including Kenya. Almost all of these flood events have significantly affected many parts of Kenya for example, the *El Nino* which was accompanied by unusually heavy rainfall in the country causing widespread floods in 1997 – 1998. It is estimated that 1.5 million Kenyans were affected by the *El Nino* phenomenon (Ashforth, 2001). The susceptibility of the country is linked to its topographical features resulting to significant damages to properties, infrastructures and even causing deaths (Lehmann, 2015).

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Although flood hazards have remained recurrent phenomena in Kenya, they turn into disasters only in few places in the country (Oyugi, Ong'ang'a & Awange, 2003). Nyatike in Migori County is one of such areas which experience recurrent floods. Other areas most commonly affected include the floodplains of Tana and Nzoia Rivers as well as the lower Nyando River at Kano Plains (Oyugi et al., 2003).

Flood event cannot be prevented, but it can only be controlled and reduced the impact. Floods came relatively quickly, so we must have the effective strategies in order to reduce the impact from flood event. Consequently, different coping strategies such as digging trenches are being employed to control floods (Skoufias & Quisumbing, 2005). Unfortunately, most of these coping strategies are ineffective such as the case of poor Philippines who were unable to protect themselves adequately following *El Nino* flooding events (Datt & Hoogeveen, 2003). This may be case for Nyatike, Migori County. Therefore in light of this situation, one could question the types of coping strategies used and factors which influence the choices of strategies adopted, the nature and extent of vulnerability, and effectiveness of these strategies.

The Kenyan Government, in acknowledging its responsibility to minimizing the effects of floods has fully embarked on various disaster management measures aimed at risk reduction, within the framework of sustainable development (GoK, 2013). In this context, it has put in place administrative, legal and remedial measures during, actual and apprehensive national calamity. One of such policy framework is the National disaster management of 2010 (Ongugo et al., 2014).

Despite the above measures, many households still suffer from the effects of floods. A comprehensive analysis of the socioeconomic effects of floods especially at the local level is yet to be undertaken. Studies carried out in Kenya in relation to floods and their effects (Mbaria, 2006; Onyango *et al.*, 2005; Nyunja, 2003) lack strong and empirical evidence. The absence of such an analysis may impede Kenya's capacity to identify key areas for intervention. It is against this background that the study sought to carry out an assessment of the socio- economic effects of floods in the households of Nyatike Division.

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1.2. Problem Statement

Kenya has been exhibiting recurrent floods over the last few decades. A case in point is the 1997/8 *El Niño* seen as one of the worst flooding event in the country (Nyakundi, Mogere Mwanzo & Yitambe, 2010). Recurring floods are experienced in Nyatike Division, Nyatike Sub - County in Migori County. Other areas most prone to flood disasters in Kenya include Kano plain in Kisumu County.

Residents of Nyatike, Migori County living in low lands flood prone suffer each year due to heavy rains and associated damage caused by the floods. The report by KIRA shows that approximately, 624 households were left homeless due to heavy rains, more specifically in Nyatike Division in 2013. It is also reported that in the same year, 520 acres of crops in the farms were destroyed, food stores damaged and food destroyed, the road linking Nyakweri shopping center and Sori town was broken following heavy precipitation interfering with the normal running of the day (GoK, 2013).

The associated adverse effects, coupled with socio-economic challenges have enhanced people's vulnerability to floods. However, there is no clearly focused strategy on the socio-economic effects of floods in Nyatike Division, Migori County. As per the researcher knowledge, most of the existing studies are restricted to other parts of the country yet Nyatike Division is equally a flood prone area. Nyakundi, Mogere, Mwanzo, and Yitambe in their research in 2010 concentrated in Nyando District. On the other hand Opondo (2013) studied effects of floods on rural households of Budalangi. In addition, Oyuyo (2014) did his research in Kano Plain. Besides, he only focused on effects of floods on micro and small scale enterprises leaving out the aspect of coping mechanism employed by the study population

Based on these reasons, the current research focus was on the issue of the socio-economic effects of floods in Nyatike Division, Migori County. This study is a step towards addressing effects of floods and the possible ways and methods which can be used to reduce the effects on people of Nyatike Division.

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1.3. Objectives of the Study

The main objective of the study was to assess the socio-economic effects of floods in Nyatike Division, Migori County.

The specific objectives were:

I. To examine effects of floods on the family ties in Nyatike Division, Migori County.
II. To determine effects of floods on the health of people of Nyatike Division.
III. To establish effects of floods on household property in Nyatike Division.
IV. To assess coping strategies used by households in response to floods.

1.4. Research Questions

I. What are the effects of floods on the family ties in Nyatike Division, Migori County?
II. What are the effects of floods on the health of people of Nyatike Division, Migori County?
III. What are the effects of floods on household property in Nyatike Division?
IV. What coping strategies are used by households in response to floods in Nyatike Division, Migori County?

1.5. Justification and Significance of the Study

According to Parker and Hut (2010), floods cause natural threats to life, health and population of both human and animals. The number of people left homeless during floods is relatively high and several properties destroyed. The destruction of roads and other infrastructure may delay or disrupt the normal functioning of the day hence reduced economy. Although similar studies have been done elsewhere (such as Opondo, 2013; Oyuyo, 2014), Nyatike Division is unique and therefore this study was intended to reflect the uniqueness.

The significance of this study lies on the fact that it would provide information on the effects of floods and methods which can be used to reduce the effects on the people of Nyatike division. More importantly, it is hoped that the study findings would provide better insights on ways to reduce flood effects and would make work easier for future researchers. It is also believed that, the study would give a clear picture of the situation in Nyatike Division during

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floods. This can provide framework for appropriate interventions in reducing flood risks while also enhancing response to floods.

1.6. Scope of the Study

The study was about socio-economic effects of floods in the households of Nyatike Division Migori County. The study was limited to related flood experience/s by the respondents; it is not linked to specific flood event. The findings from this study may not be generalized to other areas when assessing data and making interpretations that would be appropriate across broader scales.

1.7. Limitation and De-limitations of the Study

The study considered socioeconomic effects of floods of the people of Nyatike; however, the researcher did not address the emotional aspect of the people during floods, as this was not captured in the study objectives. People's answers were informed by the questionnaire and interview guides of this project and this could limit them.

Consequently, getting information from the health professionals and government officials was difficult. Some of these departments were not even sure with their basis of statistics, and were reluctant to give out what they have, arguing that the records may not give the researcher the information she needed.

Language barrier was a problem, the questionnaires were written in English yet some of the respondents could effectively express him/herself in native language (Luo).This limited them from giving all the information required.

1.8. Definition of Terms

Family ties: This can be defined as some feelings of belonging which makes us pertain to a family or larger social system (Ashforth, 2001).

Flood: This is short term or temporary covering of land by water outside its normal confines.

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Gender differentiated impact: This is used to describe impacts of floods which differ in terms of one's gender. It describes the different impacts of floods between males and females.

Gender: this is used in the study as societal constructed traits of females and males including the different roles, norms and interactions.

Household: A person or group of people who occupy the same dwelling as their primary residence

Risk: This is viewed as the likelihood of a flood taking place in a given area and its probable consequences for the people and their properties (Wisner et al. 2004).

Traditional knowledge: This describes skills, practices and know-how often developed, maintained, and passed on from generation to generation within a given community as part of its cultural identity. In the context of this study, the knowledge relates to manage floods.

Vulnerability: This refers to individual's or groups' traits, capabilities/abilities influencing their resilience including coping with, resisting and recovering the destructions associated with disasters like floods (Wisner et al. 2004).

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CHAPTER TWO
THEORETICAL AND EMPERICAL LITERATURE REVIEW

2.1. Introduction

This chapter seeks to present a broader perspective on natural disasters and environmental hazards along the research objectives and questions. The chapter starts by a review of key concepts. This is followed by historical review of floods in Kenya. This chapter also presents discussion on vulnerability with highlights on factors influencing it, followed by discussion on socio-economic effects of floods on the household livelihood. The chapter discusses the main theory guiding the study. The last section in this chapter is conceptual framework which shows the main variables in the study and how they relate to each other.

2.2. Review of Key Concepts

The section begins by giving a succinct review of some of the key concepts –flood –socio-economic effect of floods in the present study as used in the literature.

2.2.1 Floods

Flood has been defined differently by various scholars and institutions. According the European Union (2006), flood is a temporary denudation of flat by water from rivers and from the lake/sea excluding those from the sewerage systems. Tapiwa et al, (2010) describe flooding as a particular stage where water becomes excess beyond its natural made banks or artificial channels and flows on the dry land. The authors explain that floods are a product of excessive precipitation within a short time-frame. They also believe this can result from ice jams especially during spring rise in river channels. Similar definition has been given by ILGS, IWMI, (2012) where floods is -seen as excess or accumulation of water which often covers dry land.

All the various definitions have a common understanding that floods inundate the dry land and when this dry land is built, then lives and properties are affected. It should always be

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remembered that flooding is considered as a serious issue because of the damage to lives, property and infrastructure.

Floods occur when drainage basins reach maximum capacity and are unable to absorb additional precipitation resulting from certain weather phenomena such as heavy rains, tropical cyclones and other events (Karley, 2009). In the words of Few (2003, p.44) floods entail "excess water from rivers usually caused by prolonged seasonal precipitation or rainstorms; it also includes concentration of rainwater in low-lying areas especially those with high water tables or poor drainage. However, the most common cause of floods is heavy rains (Tshakert et al., 2009). In the case of Kenya, human activities such as intensive economic use of the flood plain for agriculture and livestock farming among others are the factors which modify the nature of the ground surface and its hydrological response to precipitation thus facilitate the incidence of floods.

There are various causes of floods. However, Nott (2006) states that this can be categorized into two broad causes. The first one is the physical causes which are basically natural causes especially as result of climate changes and rainfall. The second category is the human based causes. Here, the authors cite clearing of vegetation, infrastructural developments as well as other human activities as the obvious causes of flooding events. The two factors, natural and human are associated with excess and prolonged rainfall and other related events globally (Nott, 2006). The author bases his arguments on the assumption that these events may go up to days, weeks or months of prolonged and continuous rainfall. The author insists that human based activities including human settlements, cutting down trees or farming tends to encourage flooding events. For instance, changes in land-use have a direct and significant influence on the level or degree and behavioral aspects of flooding internationally. Cutting down trees also influences flooding since it causes water overflow which overwhelm channels' capacities following high rates of sedimentation.

In relation to its destructive aspects, Nott (2006) argues that under normal circumstances, floods may not be viewed as a serious hazard but only when it threatens human life and caused destruction to properties. The common areas prone to floods are several but especially

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flat and low level sections of flood-plains, low lying coastal areas or deltas. Again, small basins which are also susceptible to flooding events especially flash floods. The argument is that the human population is usually more attracted and likely to settle along rivers because of their potentials including transport-links, water for domestic and industrial usage, fertile grounds for farming among others. As a result of this, floods become even more hazardous especially with the increased settlement of the human population.

A study by International Flood Initiative (2003), described floods as one of the most serious disasters as a result of water, causing threat to the human life in terms of their cultural and ecological bases as well as their material assets, leading to compromised livelihoods for many lives on yearly basis. In the study, the most serious effect of floods was manifested by the emotional aspects for most of the floods victims. In another study, a follow-up of the International Flood Initiative, it was also observed that the secondary outcome of floods traumatized most of the flood victims and this depended on factors such as the degree or extent of floods, socioeconomic profiles of the victims including their financial status, age and gender. The study established that there was optimum effects of floods among those with low income earners and those living in poor houses were mostly affected (Flood Management in Australia, 1998) implying that floods was associated with socioeconomic consequences which the present study sought to build upon.

As already highlighted, economic activities or development in the third world nations is one of the factors influencing risk of flooding. In relation to the rising levels of population rate, and encroachment of flood prone areas as well as mushrooming of informal settlements causing enlargement zones particularly in big cities (Kundzewicz, et al. 2002). In his study dubbed Constructing Vulnerability using a Historical, Natural and Social Generation of Flooding in Metropolitan Manila, Bankoff, (2003) illustrates how floods can be encouraged by human activities. He gives the case of Philippines in south Asian region where floods result from the effect of more-localized human activities. The author argues that a whole range of socio-economic factors such as land-use practices and policy responses as well as living standards tends to influence frequencies and occurrences of floods and other natural hazards leading to disasters.

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Statistical trends showing the increase cases of floods and their adverse effects on human life especially in recent years confirm the assertions made by Bankoff (2003). It is indeed true that there have been more cases of floods related disasters due to the fact that the increased human based activities such as deforestation; overgrazing and urbanization just to mention but a few, tend to worsen environmental conditions making people even more susceptible.

2.2.2 Coping Strategy/Mechanism

Coping mechanisms can be conceived as a means of looking at community's strengths and weaknesses as well as their resilience as opposed to solely focusing on their susceptibility. Dekens (2007) describes coping mechanisms as people's response to disasters in the context of resources availability and expectations, all with the aim of meeting specific objectives. From this perspective, household's coping mechanism may be seen as a process of providing appropriate solutions to challenges within the limits of resources availability. Dewi (2007) insists that it is important to study coping mechanisms being employed during disasters. The author further argues that such mechanisms or strategies for controlling floods may be established from recurrent events and learning from these events.

2.3. Historical Background of Major Floods in Kenya

Floods of 1961, popularly known as Uhuru Floods, represents one of the early attempts of studies initiated for the purpose of studying the extent and magnitude of the flooding menace. That inundated extensive low lying areas and caused widespread damage and destruction of existing infrastructures; dams, bridges, homesteads etc. as well as other facilities that existed then in Kenya *(*Republic of Kenya, 2004). These floods mainly hit the Lake Victoria basin and the coastal areas of the Athi, Lamu and Tana River basins; however, the detailed features are not well documented.

The second flooding event is associated with the famous 1997/8 El Niño rains. The floods caused the loss of life of human and livestock, disrupted socio-economic activities due to the extensive damage to property, infrastructure and communication facilities, DMCN (2004). Further, the floods were also associated with soil erosion, silting and extensive degradation of

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land as well as erosion of riverbanks, which affected water intake facilities and river gauging facilities, which are the basis for the operation of the National Hydrological Services in the country. The flow-measuring structures washed away by the floods included weirs, water-level gauges and data loggers. These facilities assist hydrologists to capture river level fluctuation data and this type of data forms the basis for the water sector resource management and development (Republic of Kenya, 2004).

Another worth event worth noting is the April/May 2003 Floods. In this season, Kenya experienced massive flooding in the Western Province at Budalang'i and the lower reaches of the Nzoia River, and also in Nyanza Province at Ahero within the lower Nyando River basin. Further, the heavy rains that caused the flooding led to water supply disruption in urban and rural centers and washing away of river gauging facilities constructed along the rivers. Among the most notable observations of the April/May 2003 flooding were (i) Complete inundation of the Budalang'i area and the Nyando River floodplain downstream of Ahero Town as a result of breaching of the dykes in the Nzoia and Nyando Rivers, respectively, (ii) Washing away of data loggers, water-level recorders, river gauging structures and bridges, affecting communication and flow monitoring activities in the field.

2.4. Vulnerability to Floods

In most cases, vulnerability as a concept is usually associated with natural induced hazards and disasters. The term means different things to different people. Dow (1993) defines vulnerability to hazards as people's differential incapacity to deal with hazards, based on the position of groups and individuals within both the physical and social worlds. Building on this vulnerability can be seen as a function of two attributes: 1) exposure (the risk of experiencing a hazardous event); and 2) coping ability, subdivided into resistance (the ability to absorb impacts and continue functioning), and resilience (the ability to recover from losses after an impact). In everyday use of language, the term vulnerability refers to the inability to withstand the effects of a hostile environment.

According to Birkmann *et al.,* (2013) vulnerability refers to disposition of a given system to some form of harm, usually determined by its exposure, susceptibility and capacity/resilience.

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It is also defined as individual's or groups' traits , capabilities/abilities influencing their resilience including coping with, resisting and recovering the destructions associated with disasters like floods (Wisner et al. 2004). Put it differently, as a set of pre-conditions affecting communities' resilience and ability to deal with disastrous events like floods (Oulahen, 2014).

Vulnerability, hazard and consequently risk, have temporal and spatial scale ramifications; indeed the choice of an appropriate spatial scale significantly affects the effectiveness of disaster risk reduction interventions. In particular for residents of Nyatike division, better information can be obtained by operating at the local scale because the impact of the flooding is mostly felt at this scale. In this regard, this is the relevant scale to use in Kenya, thus should be given careful considerations.

Recent studied have provided new insights on vulnerability and how human-beings interact with their surroundings. In their research concerning poverty, vulnerability and the effects of flood events in the province of Limpopo, South Africa, Khandlhela and May (2006) explain that although everyone is affected by disasters in one way or another, the poor and the low income earners are more susceptible due to a series of factors or circumstances. The two authors observed that vulnerability to flooding events was an outcome of social, economic and political based processes. According to Gao, Nickum and Pan (2007) since time immemorial, areas with favourable climatic conditions have always attracted people. The three authors asserts that policies aimed at controlling floods need to be seriously implemented to help community and societies to improve their resilience to flood-based hazards. Gao, *et al.* (2007) state that floods continue to be the most serious natural disaster in China despite the fact that water shortages sometimes attract most headlines in the media.

One of the issues is that individuals have a wide range of vulnerability which usually depends to internal and external factors and characteristics upon the households in question. With this in mind, understating why people have different levels of susceptibility becomes more critical in charting the most appropriate response strategy (Behrman, Bryan & Goh, 2014).According to Ginige, Amaratunga and Haigh (2010) the different factors that encourage peoples 'vulnerability include, disability and socio-economic profiles including age and gender.

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Ariyabandu and Wickramasinghe (2005:22) observed that some groups are more vulnerable to floods than others. The two argue that vulnerability is not just poverty, but the poor tend to be the most vulnerable due to their lack of choices. The influences of both poverty and development process on people's vulnerability to disaster are now well established. The authors further noted that because vulnerability plays such an important part in why natural hazards become human disasters, it then important to examine the characteristics of vulnerability. Conditions of vulnerability are a combination of factors that include poor living conditions, lack of power, exposure to risk and the lack of capacity to cope with shocks and adverse situations. Vulnerability is also influenced by class; ethnicity, gender, disability and age are some of the factors affecting people's vulnerability (Amaratunga et al. 2010).

Gender is one of the factors which explain extent of vulnerability. When investigating gender differences, researchers commonly make a distinction between biological sex and gender, Gender is usually viewed as a social construct of what male and females are required to do, or how they are supposed to behave. According to Haas (1999, p 115), gender is "a set of socially defined boundaries that tells what is the preferred masculine or feminine behaviours, their values and personality traits as well as their roles within a given society". Bornstein (1998) expands this rather black-and-white distinction and describes several other aspects to gender, including: (1) gender role; (2) gender identity. It is therefore essential to understand gender based implications of natural disasters in order to effectively handle risk management and achieve suitable resilience (UNISDR, UNDP & ICUN ,2009).

Ariyabandu and Wickramasighe (2005) suggest that although women are often more vulnerable to disasters than men (owing to conventional gender responsibilities and relations) they are not just helpless victims as often represented. Women have valuable knowledge and experience in coping with disasters. Yet these strengths and capabilities of women are often ignored in policy decisions and in mitigation, thereby, allowing these valuable resources to go to waste and sometimes creating dependency situations. Thus ignorance of gender differences has led to insensitive and ineffective relief operations that largely bypass women's needs and their potential to assist in mitigation and relief work.

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According to Rashid (2000), women and children are the most vulnerable during the disasters. During the 1998 floods, the women shared stories about the difficulties they faced in gaining access to basic sanitation as most of the latrines were submerged by the floodwaters. Women resorted to a number of desperate measures to cope with the predicament. Some of the women admitted walking long distances with female relatives or planned trips together by boat to other less flooded areas to use the latrines. Ninno, *et al*. (2003) stated that the 1998 floods in Bangladesh caused severe damage to the rice crop and threatened the food security of tens of millions of households. Government food transfers to the affected people helped limit the impact of the flood on household access to food. The flood led to major crop losses, losses of other assets and lower employment opportunities and thus affected household income as well as market prices

Jayaweera (2005) presents a brief statistical study of impact at the household level in two southern districts in Sri Lanka, and asserts that women suffered disproportionably, and the elderly in particular. Generally, the author finds that women were more vulnerable in terms of livelihood opportunities and harassment, and that they had greater responsibilities. Additionally, she concludes that more women than men died, and that people found the distribution of aid to be uncoordinated and inefficient. The current study is also interested in finding out socioeconomic effects of floods on people of Nyatike Division, Migori County.

According to Dixit (2003) vulnerability is the condition of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. Vulnerable conditions of families make it hard to reconstruct their livelihood following a disaster. Families live in conditions that are vulnerable to disasters out of ignorance about the hazards or their erroneous perceptions of risk. Also, most have little freedom to choose how and where they live. Vulnerability, therefore, is not static but a dynamic process that depends upon the social, economic and political contexts that change overtime, which will consequently affect the probability of loss. On the other hand, the author suggests that strengthening social resilience capacity would reduce vulnerability. These social, political and economic conditions and their interrelationships during normal times determine why certain sections of the societies are more vulnerable to disasters than others (Dixit, 2003).

ST. PAUL'S UNIVERSITY

2.5. Review of Empirical Studies

Dixit (2003) observed that in Southern Nepal, flooding leads to large scale disruption of social and economic lives. The rivers bring large sediments whose deposition on agricultural lands harms productivity. The poor mostly live in these floodplains (vulnerable zones) because they have no opportunity to live in less hazardous areas. In Nepal, every year floods cause death, cultivated fields and irrigation, bridges and rural infrastructure. The author argues that policy makers, donors and relief and development agencies treat flood disaster as isolated events that break the continuity of the normal way of life.

In a study of Know Risk (2005), it is observed that the economic impact of natural disasters shows a marked upward trend over the last several decades worldwide. The hazards tend to hit communities in developing countries, increasing their vulnerability and setting back their economic and social growth, sometimes by decades. The floods have led to loss of human life, destruction of social and economic infrastructure and degradation of already fragile ecosystems and social structures in developing countries. The study indicates that social impacts include changes in people's way of life, their culture, community, political systems, environment, health and wellbeing, their personal and property rights and their fears and aspirations (Know Risk, 2005). In this study it was suggested in the results that, social impacts are linked to the level of well being of individuals, communities and society. It include aspects related to the level of literacy and education, the existence of peace and security, access to basic human rights, systems of good governance, social equity, positive traditional values, knowledge structure, customs and ideological beliefs and overall collective organizational systems. Some groups are more vulnerable than others, mainly those less privileged in society.

Mwape (2009) examined the impact of floods on the socio-economic status of livelihoods for the people of Sikaunzwe Community in Kazungula District of Zambia. Using both quantitative and qualitative approaches, the author observed that floods impacted on people's socio-economic livelihoods and critical aspects such as agriculture, health, education, housing, water and sanitation and property and assets

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The above two studies by Know Risk (2005) and Mwape (2009) are informative in that they demonstrate that the effects of floods are differentiated according to socioeconomic status. The current study sought to establish whether is the also case in the context of Nyatike Division, Migori County.

In another study, Nyakundi, Mogere, Mwanzo, and Yitambe (2010) aimed at finding out the community perceptions and responses to flood risks in low and high risk areas of the Nyando District, Western Kenya. The study used descriptive cross sectional approach and sampled a total of 528 households, and six key respondents including government officials and project managers of NGOs and Community Based Organizations (CBOs) within the area. The researcher also relied on seven Focus Group Discussions (FGDs) involving three women, two male and two teacher groups were conducted. The authors in this study observed that majority of the respondents were aware of Traditional Flood Knowledge (TFK) and were also able to specify its use. Data analysis revealed that people's perceptions of flood risks were as a result of various reasons but mostly their past experiences of main flooding events. The study also established that households and members of community who were living in flood prone areas or high risk areas tended to have higher levels of awareness and use of traditional flood knowledge. The communities were also more aware of the nature of the flood based health risks. The study also disclosed that residents of high risk areas were more dependent on external aid. However, residents living in the low risk area seemed to be equipped with better response mechanisms. While the study offers useful insights, it failed to clearly show factors or reasons why coping mechanisms of the two groups of people/households, living in low risks and high risks were different. Again, the effects of floods on others aspects of the family including health of household members, family bonds and properties did not clearly emerged. The present study aimed at filling these research gaps.

Lee (2012) investigated the Impact of Natural Disasters on Neighbourhood Change. The study relied on Longitudinal Data Analysis. The author observed that natural disasters led to significant damages to individual properties and the infrastructure of a given location/community. Though the study provided useful background information on the

ST. PAUL'S UNIVERSITY

associated effects on disasters on properties, the author did not narrow down to specific types of disaster. Again, the author lacked empirical evidence to back his assertions about the consequences.

Shabu and Tyonum (2013) assessed the coping measures adopted by dwellers living in flood prone areas of Makurdi town. Data for this study were obtained from residents of the town living in flood prone areas. With the help of a well-designed questionnaire, photographs and personal observation, the authors were able to gather information on socio-demographic status, causes and effect of flooding, and measures adopted by residents. In total, 338 respondents were sampled across the area. From the findings, it was observed that the major cause of flooding in the area was heavy rainfall, silting up of available drainage channels, blocking of drainage with solid waste, and building structures on water channels. The study also revealed that the major effect of flooding was loss of personal property. The main coping measures adopted among the study population included frequent sand removal of blocked drainages, creation of water channels and the use of sand banks (Shabu and Tyonum, 2013).

Opondo (2013) examined losses and damages from floods that rural households in Budalangi District, incurred despite or as a result of the coping and adaptation measures they adopted. Specifically, the authors sought to assess effects of floods on the communities livelihood such as farming, rearing livestock keeping and fishing; examine the coping and adaptation measures employed by the study population; to study the extent to which these measures employed were successful in avoiding loses and damages; and to make policy recommendations for addressing future effects of floods. Applying descriptive research approach, the author observed that most of the families in the study area faced many livelihood stressors such as high poverty levels, rapid population growth, and increased pressure on land and water resources and inadequate livelihood opportunities as well as poor educational levels. This constrained their capacity to cope and adapt during floods and other extreme climatic changes. The author also established that the climatic stressors also helped in making the study population even more susceptible and undermined sustainable development.

ST. PAUL'S UNIVERSITY

Attipoe (2014) research sought to analyze the causes of flooding and assessed the effectiveness of flood controls in two communities in Accra Ghana to address the problem. Face-to-face interviews were conducted with key city officials to identify the main causes of flooding and the flood control measures implemented. Surveys were held with home owners in the study communities to capture their views on causes of flooding as well as the effectiveness of mitigation measures implemented by either the government or themselves. The research found that storm drains had been constructed to prevent flooding in Alajo while Glefe had no major defense against flooding. The result was that Alajo no longer experienced flooding. Although Alajo has been a success story, the drains needed regular maintenance and management by the Hydrological Services Department to desalt the drains and to sanction residents found dumping domestic wastes into the drains. Although home owners had made attempts like constructing temporary drains, clearing choked drains and building flood protection walls to mitigate the effects of the flood in Glefe, very minimal success has been achieved. As a result, the author recommended for short and long term interventions to mitigate flooding in Glefe.

The study by Melsew (2014) is also worth reviewing. The broad aim of the study was to assess the socioeconomic impacts of the 2006 seasonal flooding and coping strategies along the flood prone areas of Dire Dawa Administration and find out recommendations which are more applicable in the administration. The author used descriptive research design and employed both quantitative and qualitative approaches. The main sampling technique was purposive sampling and that data collection was carried out using questionnaire, interviews and researcher's personal observation. The study revealed that the main causes of the 2006 flood in Dire Dawa were the combined effects of human induced and natural causes. Besides, heavy rainfall, topographic nature of the surrounding Or Omiya uplands with degraded vegetation's and extensive cultivation, deforestation, overgrazing and quarrying along flood plains contributed for the generation of flash floods in the administration. In addition, the incidence impacted on the health problems like psychological (stress), injuries, illness, losses of their family members/ relatives, displacement, and losses of their livestock. The incidence of 2006 also damaged substantial number of productive and non-productive assets.

ST. PAUL'S UNIVERSITY

Rahman (2014) sought to investigate the impacts of flood on the life and livelihoods of the affected area in a village in Manikganj District,Bangladesh.The specific objectives of the study was to assess the situation, the history, the causes, aggravating factors, extent and effects of the flood, to document the hazard and vulnerability, and various capacities of the community; to study the local knowledge, practices and beliefs in the community; to formulate community based plans for flood mitigation and flood disaster risk reduction. The study found that there are several causes of flood hazards including construction of infrastructure such as roads, culverts. Flood was found to be a recurrent phenomenon in the study area. In 2000 and 2004 floods have made some devastating impact on the study area. These flood events were unique in a sense that the floods were mainly due to the heavy precipitation in the Padma belt. The floods had damaged the physical infrastructures like houses, schools, sub-health post, hand pumps, culvert etc. as well as productive agriculture land, and livestock (Rahman, 2014). Floods also caused difficulty in mobility, increased risk for living at houses, trends of fear and trauma, and erosion of social assets such as neighborhood, brotherhood and strong bondage of kinship. Likewise, damage of stored grain and spread of water borne diseases were other distresses.

One of the recent and related studies is that Mukuna (2015) reported on Vulnerability analysis of the Gender- Differentiated Impact of Flooding in Budalangi Flood Plains, Kenya. The author specifically sought to increase understanding of gender concerns and needs in relation to disaster risk reduction by explaining the causes of Budalangi flood plains community's vulnerability. The other objective was to show evidence that the study population was vulnerable to the flooding disaster, and to come up with government capacity which address gender related issues in disaster risk reduction as well as encouraging the Kenya government to take appropriate measures/actions in integrating gender perspectives into disaster risk reduction legislation, policies and programmes. The author relied on a mixed methods approach using a sample size of 96 primary school teachers and 180 parents selected using both purposive and simple random sampling. In the study, it was observed that Geographical morphology of Budalangi found at the mouth of River Nzoia was one of the factors which increase cases of the perennial flood in Bundalangi. It was also observed that floods caused a lot of suffering especially on school going children who mostly turn into absenteeism due to

ST. PAUL'S UNIVERSITY

water borne diseases during and after the floods. The study also observed that the general family life was disturbed.

Izevbuwa and Adeolu (2015) also highlighted on the socioeconomic effects of floods though focused on economic aspects. The study relied on multistage sampling technique. It showed that most of the victims lost huge proportion of their incomes to the floods. The findings revealed further that in spite of the fact that the flood incidence reduced the income of the victims, it also worsen income inequality among the victims of the flood despite the compensation received from the government. The author recommended that there was need for the government to come up with preventive measures to help control future occurrence of flood especially among the community members residing close to riverin the areas. The study was informative except that it was based in Nigeria and as such there was bound to be regional differences which affected interpretation and conclusion. This is why there was need to study floods and related effects locally.

2.6. Socioeconomic Effects of Floods

Some of the most important direct consequences of flooding such as loss of human life or the consequent ill health of the survivors and also the economic losses are tangible. Indirect and intangible consequences of flooding are probably greatest in Least Developed Countries (LDCs), especially where frequent and devastating floods create special impacts for the survivors. Primarily losses of any disaster like flood can be high in rural areas where most of the damage is sustained by crops, livestock and the agriculture infrastructure, such as irrigation system, levees, walls and fences. In other words, primary losses relate mainly to the disruption of economic and social activities, especially in urban areas, immediately after a flood (Smith and Ward 1998).

Sinclair and Pegram (2003) stated that floods cannot be prevented but their devastating effects can be minimized if advance warning of the event is available. With large increase in population and increasing urbanization there are more people living in informal settlements, which are often on flood plains as this is the only underdeveloped land available near cities. The people living in these settlements are those who are most at risk, not only due to their

ST. PAUL'S UNIVERSITY

geographical location in the flood plain but also because they do not have the financial resources to recover from the damage caused by flooding. According to Smith and Ward (1998), there is more evidence that the flood problem is getting worse in terms of the damage caused by flooding. Despite massive expenditure on flood defense, flood damage losses continue to rise in many countries. Although most floods are more or less natural phenomena, the flood hazard is largely of human origin. Most floods results from moderate to large events, occurring within the expected range of stream flow. Floods constitute a "hazard" only where human encroachment into flood prone areas has occurred. African Wildlife (2000) also points out that the cumulative impact of human activities without regard for nature has turned the recent floods from a natural phenomenon into a man-made disaster of epic proportions. When severe floods occur in areas occupied by humans, they can create natural disasters which involve the loss of human life and property plus serious disruption to the on-going activities of large urban and rural communities. Flood losses are therefore essentially human interpretations of the negative economic and social consequences of natural events. The impact of the flood hazard will, in part be determined by the magnitude of the events and the duration of the event. However, the true significance of the flood disaster will depend primarily on the vulnerability for the local community. The relationship between physical exposure and human vulnerability is highly dynamic and can change through time (Smith and Ward, 1998). Smith and Ward (1998) also argued that direct losses to floods occur immediately after the event as a result of the physical contact of the flood waters with humans and with property. However, indirect losses which are less easily connected to the flood disaster and often operate on-long time scales, may be equally, or even more important. Depending on whether or not losses are capable of assessment in monetary values, they are termed tangible and intangible.

According to Lind, *et al*. (2008:143), the loss in case of flooding has many dimensions. In addition to economic loss and loss of life and injury, there may be irreversible loss of land, of historical for cultural valuables and loss of nature or ecological valuables. Kundzewicz, *et al.* (2002) argues that floods are natural phenomenon for which the risks of occurrence are likely to continue to grow, increasing levels of exposure and insufficient capacity among the factors responsible for the rising vulnerability. Floods have been a major concern since the dawn of

ST. PAUL'S UNIVERSITY

human civilization. They continue to hit every generation of human beings, bringing suffering and death as well as immense and still growing, material losses.

2.6.1. The impacts of flooding events on the Family Ties

Family ties may be defined as some feeling of belonging which makes us pertain to a family or larger social system. It allows us become part and parcel of something more consequential than an individual aspect of a family or community" (Ashforth, 2001, p. 71).

Previous studies indicate that floods have detrimental impacts on existing family and by extension social ties. It is said that disasters like floods can erode social assets such as neighborhood, brotherhood and strong bondage of kinship. In his study on the displaced persons following the aftermath of the Buffalo Creek's flood in West Virginia, Erikson (1976, p.191) explains that neighborliness is not something that people can carry around with them to a new location; the old community remains as one's niche in the classic ecological sense, and that it can be easily transferred to different setting.

The study by Erikson informs the present study that family ties can be disrupted through relocating to new localities or areas as a result of floods. As Olawepo (2008) observes, this relocation to new setting tends to tear apart social fabric of existing communities and disrupt occupational undertakings of the community. The present study seeks to find out if the issue of interference of the family ties is an issue in Nyatike.

2.6.2. Flooding and its Health Related Effects

Health effects of floods can be significantly severe. Floods affect human health directly or indirectly. The direct effects may occur through contact with water. On the other hand, it indirectly affects human health through the destruction of the natural and human-built environment. The health impacts of floods may be determined by the nature of floods, the geographical attributes, socioeconomic profiles of the area as well as the existing policy on preparedness and management (Du et al., 2009). However, most of the health related effects associated with floods tend to be the same and mostly oscillate around disruptive nature of floods and the inconvenience as well as uncertainty about future flooding events.

ST. PAUL'S UNIVERSITY

In a study by Reacher et al. (2004) on health related effects of floods, it was observed that flooding enhanced cases of earache, which is defined as an increase in risk of gastroenteritis, asthma, respiratory sicknesses and skin related diseases. The study also revealed that adults in flooding areas had higher chances to be affected by psychological distress related to those in non-flooding areas. The study by Reacher et al. (2003) provides useful insights for the present study except for its small sample size which was inadequate for standard levels of significance hence compromising its interpretations and conclusions.

In a study by Nott (2006) demonstrates that the direct impacts of a flood are closely related to the extent of affected area and depth of floods water. Disease occurrence is common especially in less developed countries. In Particular, malaria and Typhoid outbreaks as a result of being in contact with contaminated water after floods in tropical countries are quite common (Nott, 2006).

In Bangladesh, Rahman (2014) observed a wide range of health related consequences of floods. The purpose of the study was to investigate the impacts of flood on not only the life but also on the livelihoods of the areas affected by the crisis. To achieve this, the author utilized cross sectional narrative approach in the sampled village within Manikganj district, Bangladesh. The study revealed that out of the total number of household sampled, more than half disclosed that at least one of their household members got sick in the course of the flooding events. The most frequently mentioned diseases in the study were diarrhea and malaria as well as skin rashes.

Mental health problems have also been cited as examples of health related sicknesses caused by disasters including floods. For example, Norris et al. (2002) reported that 26% of their study population cited depression as one of the most common mental problem. What is not clear is whether the health related problems reported by the study respondents were real or was as a result of the stress caused by the disasters. Greening, Stoppelbein and Docter (2002) assessed the attributions for the adverse effects of the Northridge earthquake. They observed

ST. PAUL'S UNIVERSITY

that most victims of the disasters developed depressive symptom. Similarly, Livanou et al., (2002) investigated post-traumatic stress disorder (PTSD) and depression as consequences of the Turkish 1999 earthquake. These three different studies provide useful insight but lack sufficient evidence on the actual mechanism of how mental sicknesses are caused by disasters.

Floods are also related to deaths and injuries. There is a clear risk of death and injury during and in the immediate aftermath of flooding. It is estimated that Worldwide, over 200,000 people have been killed in flooding over the past three decades (Menneand Murray, 2013) although in developed countries mortality rate from flooding is lower. The risks associated with floods include drowning when moving through flood water. Risk is increased if water is fast-flowing or deep, and applies to both walking and driving through water. Injuries are also common particularly from being struck by objects and debris in flood water, or from unseen hazards (Menneand Murray, 2013).

An assessment on flooding and communicable diseases by WHO revealed that flooding is associated with an increased risk of infection, however this risk is low unless there is significant population displacement which and /or water sources are compromised. For instance floods in Mozambique in January-march 200 led to an increase in the incidence of diarrhea this may be as a result of contamination of drinking water (WHO, 2016). This assessment was quite good oversight for the researcher who was interested in assessing the effects of floods on the health of the people of Nyatike division in Migori County.

2.6.3. Effects of Floods on Household Property

Flood is a hazard that can reduce the asset base of households, communities and nations by destroying standing crops, livestock, infrastructure, machinery and buildings (Melsew, 2014; Lee, 2012). According to Melsew (2014), the intensity, duration and distribution of rainfall in the catchments all influence the magnitude of the resultant flood. The amount of damage caused by a flood depends on a range of factors including its magnitude, speed of onset and duration. Flood can be divided into three types: flash floods, river floods and coastal floods. In the context of the Ethiopia the first two are more relevant. Flood killed 862 people, and the

ST. PAUL'S UNIVERSITY

economic damage was close to 3.2 million USD in 2006 in Ethiopia (Cordaid & International Institutions of Rural Reconstruction, 2011).

Nott (2006) argues that physical damage to property is one of the major causes for tangible loss in floods. The author enumerates costs including damage to goods and possessions, loss of income or services in the floods aftermath and clean-up costs. In a similar note, Turtenwald (2013) explains that floods can hit hard a local economy. Residents who live in the area experience a financial burden in replacing lost items and fixing their homes. Businesses also suffer, not only from the loss of property, but also from lack of customers during the flood and for a while after recovery. Farmers also suffer from the loss of their crops. Lee (2012) argues that natural disasters lead to significant damages to individual properties and the infrastructure of a given location/community. However, the author does not narrow down to specific types of disaster. The author did not clarify whether the disaster was caused by drought or flood or any other kind of natural disasters. Again, the author lacks empirical evidence to back his assertions about the consequences.

According to Mohapatra and Singh (2003), floods have had adverse impact on people's lives and livelihoods. Floods frequently cause major infrastructure damage including damage of roads, railway lines, airports, electricity supply systems, water supply and sewage disposal systems. Bridges over rivers are particularly exposed to damage and disruption of transportation systems follows. The economic effects of flood are often much greater than the flood itself (Parker, 2000). Similar observations have been made by Theron (2007) who contends that floods have several socio-economic and political implications which caused a wide range of complex issues. The author says that some of the immediate consequences included the displacement of people, the destruction of infrastructure such as houses and roads, damage to farms and crops and loss of cattle and livestock. The destruction of roads and other infrastructure delayed on-going development initiatives and political processes (Theron, 2007). In the long-term, affected areas had to deal with the spread of infections and water borne diseases, cholera, dysentery and diarrhea which increased the need for safe drinking water and the provision of water purification tablets.

ST. PAUL'S UNIVERSITY

A study carried in Sikaunzwe community in Kazungula District of Zambia revealed that out of 300 households sampled 94% indicted that their crop fields were damaged by floods, 4% lost their fishing nets and majority of the population lost assets like beds, chairs and radios (Mwape, 2009). This study provided useful insight to the researcher in finding out the effect of flood on household property in Nyatike flood prone areas.

2.6.4. Impacts of floods on Livestock/Crops

Impacts of floods on livestock have also widely documented (Thornton et al., 2006; Rosegrant et al., 2009). Livestock is of utmost importance for status, income, livelihoods, as well as survival of populations and cultures that are relying on livestock production. It is one of the fastest growing agricultural subsectors in developing countries with an agricultural GDP share of 33 percent and covering approximately 30 percent of the surface area of land (Steinfeld et al. 2006).Livestock systems are a significant global asset with a value of at least US$1.4 trillion, employing 1.3 billion people and directly supporting the livelihoods of 600 million poor smallholder farmers in the developing world. Though there are very large differences between rich and poor countries, on a global scale, livestock products contribute 17 percent to kilocalorie consumption and 33 percent to protein consumption, making livestock a key component of world agriculture (Rosegrant et al., 2009). Thornton et al. (2006) supports that livestock are important providers of nutrients and traction for growing crops in smallholder systems and livestock keeping thus is an important risk reduction strategy for vulnerable communities. Of all the factors influencing livestock production, climate and location are undoubtedly the most significant (Lammy et al., 2012). In fact, climatology characteristics such as ambient temperature and rainfall patterns have a great influence on pasture, food resources availability cycle throughout the year, and types of disease and parasite outbreaks among animal populations.

Diseases that reduce production, productivity, and profitability are associated with the cost of their treatment, disruption of local markets, international trade, and exacerbate poverty on rural, local, and regional communities (Lammy et al., 2012). At the biological level, pathogens compete for the productive potential of animals and reduce the share that can be captured for human purposes (Food and Agriculture Organization (FAO) (FAO, 2009);

ST. PAUL'S UNIVERSITY

Rushton (2009). Apart from the impact of floods and associated direct consequences on agriculture, the impacts may as well be exacerbated by the levels of involvement of decision makers before, during, and after the flood disaster.

2.7. The socio-economics of coping strategies

Coping strategies adopted are in most cases influenced by prevailing household's circumstances as well as the nature of disasters being experienced by the households (Schipper et al., 2011). It has been argued that gender influences the type of coping strategy to be adopted by household. For instance, Dilley et al. (2005) explain that gender plays important roles with regards to households' decision making about a given activity or coping strategy deemed appropriate in dealing with climatic stresses. Whether this is true or false is still subject to investigation since there may be some factors which may lead to roles' specialization. A good example is the absence of women taking part in some of the traditional activities.

Household-specific characteristics like age and education level of the household head are also important in the choice of a particular coping option along with other key variable (Unmesh & Narayanan, 2015). Berman, Quinn and Paavola (2013) observe that during climatic stresses such as floods and droughts, older household heads tend to favour social support compared to the youths or younger households. Although the study relied on empirical data from Uganda; it gives useful insights on how ones age may affect his or her decision on the coping strategy to adopt.The current study will specifically focus on socioeconomic effects of floods on the households of Nyatike and how they respond to flooding events.

2.7.1. Coping strategies and the household's well-being

Well-being can be understood as a dynamic concept, consisting of various linked component. Adaptive decision affects the well-being outcome of individuals, households, groups and communities. Adjusting their livelihood to changed circumstance may either improve or worsen the household well-being. A strategy of alternative income generation applying may result in an increase in income but also possible with negative side effects such as increase insecurity or health risks (Behrman, Bryan & Goh, 2014).With respect to assessment of well-

ST. PAUL'S UNIVERSITY

being impacts, this means that one needs to be careful while developing a given coping strategy.

2.8. Theoretical and Conceptual Frame-works

2.8.1. Theoretical Framework

This research is guided by the cultural theory developed by Douglas and Wildavsky (1982). This theory helps in explaining the various perceptions of people in relation to risks and conflicts and approaches used to deal with these issues. This theory holds the assumption that organization of social structures offer community or individuals with perceptions which tend to reinforce these structures usually in conflicts with the existing alternatives. Under this theory, culture is viewed in two classes, on one hand is a high group which experiences a high level of collectiveness as opposed to a low group characterised by individualisms (Douglas & Wildavsky, 1982). The second classification is a high grid culture where life is associated with deliberate and durable forms of stratification in terms of authority and societal roles. The opposing side is the low grid reflecting a more egalitarian way of life.

From the above classification, four unique cultural systems can be indentified which include egalitarianism, hierarchical based system, individualistic setting and fatalistic orientation. In Hierarchical type, unequal social relations are the order of the day and this system fares well through strict controls via specified rule and regulations (Douglas & Wildavsky, 1992). Individualists systems tend to prefer market organization while opposing strict rules and regulations except when they are for corrective measures. Egalitarian system is also opposed to hierarchical structures but prefer good group relations characterized with solidarity and commitment to equality of opportunities. This system sees nature as fragile, and strongly interdependent as well as being ephemeral. Fatalisms tend to be low in relation to the two grids and usually view nature not random but capricious. Cultural theory assumes that people who identify with each of the four solidarities have different understating about risks.

2.8.1.1. Relevance of the Theory

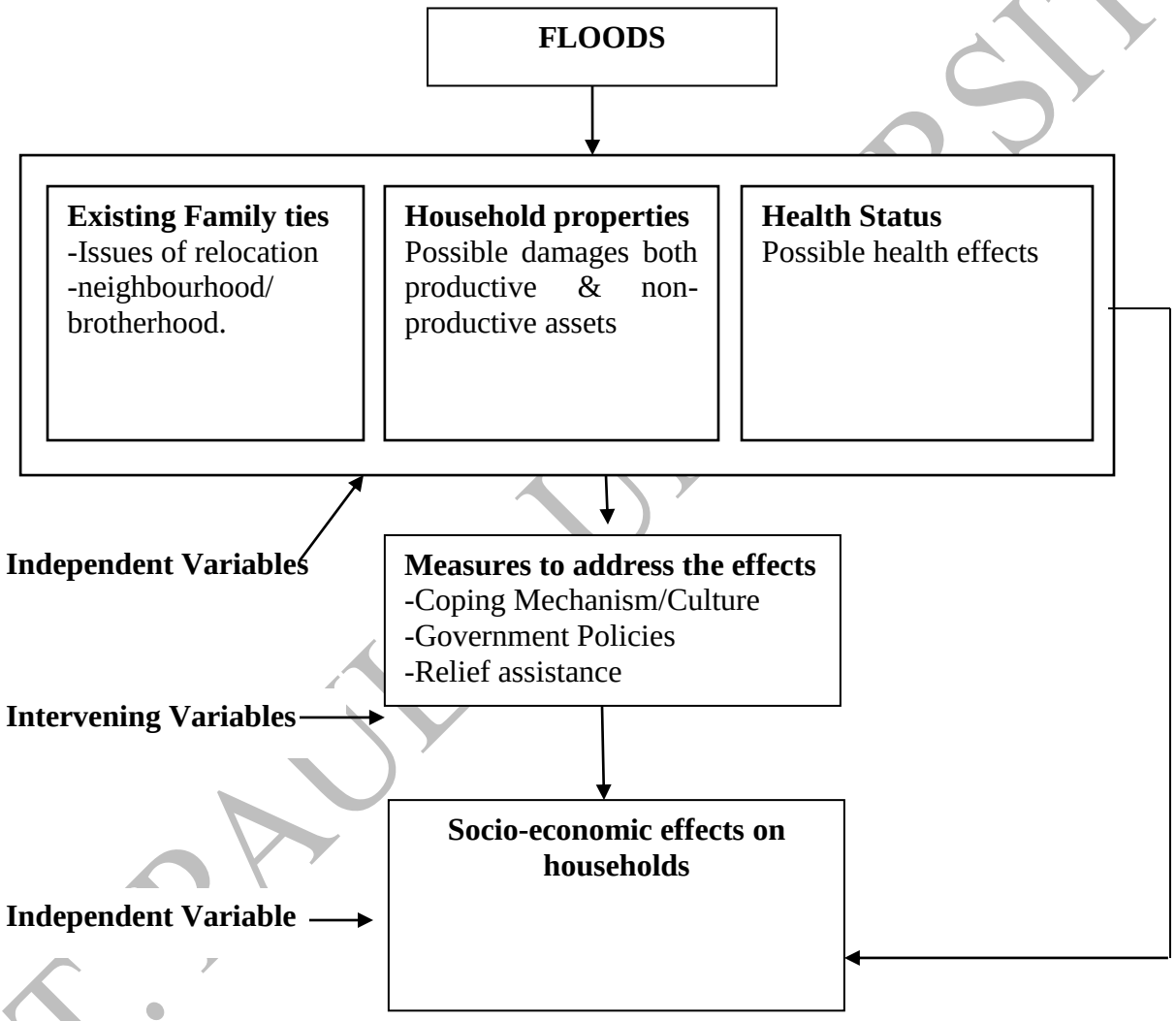
This theory helps in the understanding how cultural perspectives on floods and associated risk influence the formation of coping strategies. It will be intriguing to examine the existing coping strategies to determine whether they are based on one or multiple cultural perspectives

ST. PAUL'S UNIVERSITY

or dominant risk perceptions, and compare them according to their success (or perceived potential for success).

2.8.2. Conceptual Framework

Based on the above literature and theory the researcher developed the conceptual framework to give a better understanding of the relationship between floods and socioeconomic effects on households. Figure 2.1 below is the conceptual framework for the study



(Source: Author 2016)

Figure 2.1. A conceptual framework showing the relationship between the floods and Socio-economic Effects on Households

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The framework, shown in figure 2.1, describes the various variables guiding the study. In considering socioeconomic effects, the researcher paid attention to three major independent variables: Existing family ties, health status, and household properties. These three are dynamic and their variation influences dictate degree of the socio-economic effects in many ways. For instance, when members of the households are forced to move to safer areas, then the likelihood of family ties being compromised becomes high. Moving to other areas also means a change in neighbour hence interfering with family ties. Variation in household properties also influences the level of socioeconomic effect on the household. Households with many properties are more likely to incur most losses compared to those with few properties. Floods are associated with borne diseases and breeding of mosquitoes. This may affect the households depending on the health status. Households with already poor health are more likely to suffer more from the effects of the floods. The overall socioeconomic effects of floods on households can be controlled existing measures. This brings in the issue of culture which covers existing coping mechanism for controlling the floods. As observed from the theoretical framework, culture of a people assists in formation of coping mechanism. Other measures such as government policies, relief assistance may also help in minimizing the effects brought about by the floods. All these factors make up the intervening variables.

2.9. Research Gaps

As outlined above, there are a mass of studies contributing to the understanding of Socio-Economic effects of Floods among Households. Attempts have been made to explain why people still suffers from the effect of floods despite existing policies and remedial measures. In some studies (such as Dixit, 2003) it is noted that government policies are either inadequate or ineffective in addressing the flood menace. According to the literature, socioeconomic effects of floods are not uniform across regions and among communities. As suggested, social impacts are associated with level of well being of individuals, communities and society. Coping mechanism also differs depending on the one's socioeconomic status. For instance, it has been alleged that people residing in the low risk area seemed to be equipped with better response mechanisms as opposed to those living in high risk areas.

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The studies reviewed offer good insights and framework upon which the study is built. However, they suffer from various shortcomings. For instance, some of the studies such as that of Lee(2012) gives a general views of disasters and their effects without narrowing down to specifics. It is also not very clear how floods impacts on households especially in terms of social ties and extent to which floods can be regarded destructive to household properties. The link between health effects and floods is also not clear. This is because some people are suffering from ill health even before the floods. Besides, most of the studies done so far are case studies which are specific to certain regions due to the highly contextual nature of the subject. The current study attempted to fill this gap using a case of Nyatike Division, Migor County to show the socioeconomic effects of floods.

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CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Introduction

This chapter three presents the research methodology of the study carried out in Nyatike Division, Migori County. It also describes and justifies the methods and processes used in collecting data and answering the research questions in order to achieve the research objectives. The chapter also focuses on the research design, research instruments, data collection procedures, data presentation and analysis as well as ethical considerations.

3.2. Research Design

Ogula (2005) describes a research design as a plan, structure and strategy of investigation to obtain answers to research questions.This study used descriptive research design in assessing The Socio-Economic Effects of Floods in the Households of Nyatike Division in Migori County. This type of design describes prevailing phenomena which do not allow for manipulation of variables (Komb & Tromp, 2006). However, according to Bryman and Bell (2003) descriptive survey design is where data is collected majorly by questionnaire or interviews on more than one case and at a single point in time. Based on this view, the study was conducted in the study area using interview guides; both structured and semi- structured questionnaires were administered to obtain the responses from the respondents.

The rationale for using a descriptive research design was to describe the opinion of respondents on the socioeconomic effects of floods in Nyatike Division. This design was found appropriate as it enabled an in-depth study of the relevant variables in establishing the links between floods and socioeconomic effects on the households. This design is ideal for studies that aim at describing a particular situation at a specific period of time; those that are seek to find out what people think and what they do(Komb & Tromp, 2006).

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3.3. Study Area

The study was conducted in Nyatike Division, Nyatike Sub- County in Migori County found in the south western part of Kenya bordering Homa Bay County to the north, Kisii and Narok counties to the East. The county has five constituencies namely; Rongo, Migori, Uriri, Nyatike and Kuria. The area is characterized by undulating hills and plains as well as ranges. It experiences annual rainfall which ranges between 600 – 1200 mm.Bimodal rainfall pattern obtained in the months of February and may, while second rainfalls between months of August and November. Humidity is relatively high due to local winds.

According to census population report 2009, Nyatike Sub- County has a population of 144,625 with a poverty level of about 44 %. The main economic activity in this area includes farming, fishing and trade. Nyatike Sub-county is divided into five divisions, namely, Nyatike, Karungu, Muhuru, Got Kachola and Oria Division. Nyatike Division is more susceptible to floods due to the two main rivers in the area; Kuja and Migori Rivers bursting their banks and thus changing the course of the rivers. Nyatike was chosen since the area is flood prone and that no comprehensive study done so far.

3.4. Target Population

The study targeted communities at risk of flooding and who are residing within Nyatike Division. Therefore the target populations for this study constituted the households of Nyatike Division. In total there were a total of 624 households (KIRA, 2013)

3.5. Data Sources

Primary and secondary data were used in this study. Secondary data enabled the researcher to understand the concept of socioeconomic effects of floods on the households living in flood plain areas. Secondary data was obtained from relevant literature both published and unpublished, government reports, policy documents, health service reports, and Appeal by Disaster Preparedness and Prevention. Primary data was obtained from different stakeholders such as households affected by floods or prone to flood, health professionals (health education and, environmental health) NGOs that are currently working in the region and government departments (Water, Disaster Prevention and Preparedness Agency, and Metrological

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Agency) at different spatial levels. To achieve this, the researcher used semi-structure questionnaires and in-depth interviews with key informants.

3.6. Sampling Procedure and Size

3.6.1. Sampling procedure

Mugenda (2009) defines sampling as a process of selecting a group of people, events or behaviour with which to carry out an investigation/ study. Kumar (cited in Gyamfi, 2010) confirm that in sampling, a portion that gives the correct representative of the whole population is selected or considered. The researchers do not normally make direct observations of each and every individual in the population they are studying but they collect data from a subset of individual (a sample) and use those observations to make inferences about the whole population (Muzinda, 2007). It is easier to use a sample rather than collecting data from the entire population of the study area as this would need a lot of time and resources hence far much expensive and tiresome.

The researcher employed both probability and non probability designs to select a reasonable number that represent the target population. In this regard simple random sampling was adopted to select the sample unit which is the households of Nyatike Division. The sampling frame was drawn from District Commission Office (DCs).The researcher chose to adopt simple random sampling due to the fact that the population under study was homogenous and therefore a study from sub- set of individuals (a sample) was appropriate in making inferences about the whole population (Muzinda, 2007).

The researcher also applied purposive sampling technique to select key informants such as Government officials, NGOs working in the area and health officers.

3.6.2. Sample size

The study sample was determined by the 30% formula for sample size (Mugenda and Mugenda, 2003). The authors explain that sample size of between 10 and 30% is a good representation of the target population that is less than 10,000. The target population of this study was 624 households (KIRA, 2013) as stated earlier and thus the minimum number of

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questionnaires to be administered would be 187. Due to anticipated fieldwork challenges associated with administering questionnaires a total of 206 were administered to get data from the respondents. Out of these, 4 were not properly filled hence, reducing the number to 204 questionnaires filled correctly.

3.7. Research instruments

Orotho (2004) defines research instruments as tools for collecting information about a given phenomenon under study. In order to study the socio-economic effect of floods in Nyatike Division,

3.7.1. Questionnaires

The current study used semi-structured questionnaires which were distributed through hand delivery to households of Nyatike Division in order to collect data from them.

In total, 206 questionnaires were distributed to the respondents. However, 2.4 % or five of the questionnaires were spoilt (partially filled) giving a response rate of 97.6% as shown in Table 3.1 below.

Table 3.1. Response Rate

Questionnaire	Number	Percent
Successfully filled	201	97.6
Spoilt(partially filled)	5	2.4
Total administered	206	100.0

Source: Field data, 2016

The study's response rate falls within the recommended 70 % threshold. Mugenda and Mugenda(2009) argues that a response rate of 50 % is adequate for research analysis and reporting; response rate of 60% is good while that of 70% and over is excellent. The overwhelming, 97.6% response rate to the study clearly shows the receptiveness of the respondents about the study.

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Qualitative key informants interview were also conducted for key informant's (conducted using interview guides).

3.7.2. Key Informant Interviews (KIIs)

The KIIs were conducted for those people who were knowledgeable and knew more about the socioeconomic effects of floods in the study area. In particular, government officials such as chiefs, professionals like doctors, who have firsthand knowledge about the community and the problems people undergo during floods were selected purposively and interviewed. According to (Gillham, 2000), Key informant interviews are qualitative in- depth interviews with people who know what is going on in the community. The purpose of using the KIIs is to help gather information vis-à-vis the focus of a particular study.

3.8. Validity and Reliability

A study instrument is only valid if it measures what it is intended to study and accurately achieves the purpose for which it was designed(Kombo &Tromp, 2006). The study used pilot study to ensure the accuracy of the questions used for the interview is guaranteed. Five participants (households) took part in pilot study. Validity being judgmental, content validity was evaluated by judging and reviewing the content from the instruments used. During the pilot study poorly answered or ambiguous questions was eliminated and some reframed to improve clarity and avoid ambiguity.

Reliability is defined as the extent to which an instrument yields consistent results after several attempts (Mugenda and Mugenda, 2003). In order to maintain reliability and validity, two data collection tools were used to study the phenomenon. As pointed earlier, the main tools for data collection was household questionnaires and an interview guide for key Informants Interviews. Reliability was achieved through pretesting of the research instruments especially the questionnaire. This informed and enabled the researcher to know if the research findings were likely to produce the anticipated results with the population targeted by the study.

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3.9. Data Analysis and Presentation of Findings

The data collected from administering questionnaires (quantitative data) was scrutinized (data cleaning) for completeness, coding, organization and scoring in readiness for analysis. Only those qualified from the data cleaning criteria was subject to analysis. The screening process ensures consistency in the data while preparing for data entry and manipulation. In preparation for analysis, data was entered based on set variables into the computer applications with the help of SPSS to get tables, charts and graphs.

Qualitative data was analysed by the use of thematic analysis. This involved coding and identifications of potential themes that are relevant to the study. The findings were reported in the form of frequencies, percentages and narrations/ verbatim quotations to give the respondents opportunity to speak for themselves.

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CHAPTER FOUR

STUDY FINDINGS AND DISCUSSIONS

4.1. Introduction

This chapter presents a discussion on research findings and presentation. Findings are presented under the following major headings: response rate; demographics; traditional knowledge; effects of floods on the family ties; effects of floods on the health of people of Nyatike; effects of floods on household property, and coping strategies used by households in response to floods.

4.2. Demographics

4.2.1. Gender of Respondents

Out of the two hundred and one respondents sampled in the survey, 62.2% were males and the remainder, 37.8% females (Figure 4.1).

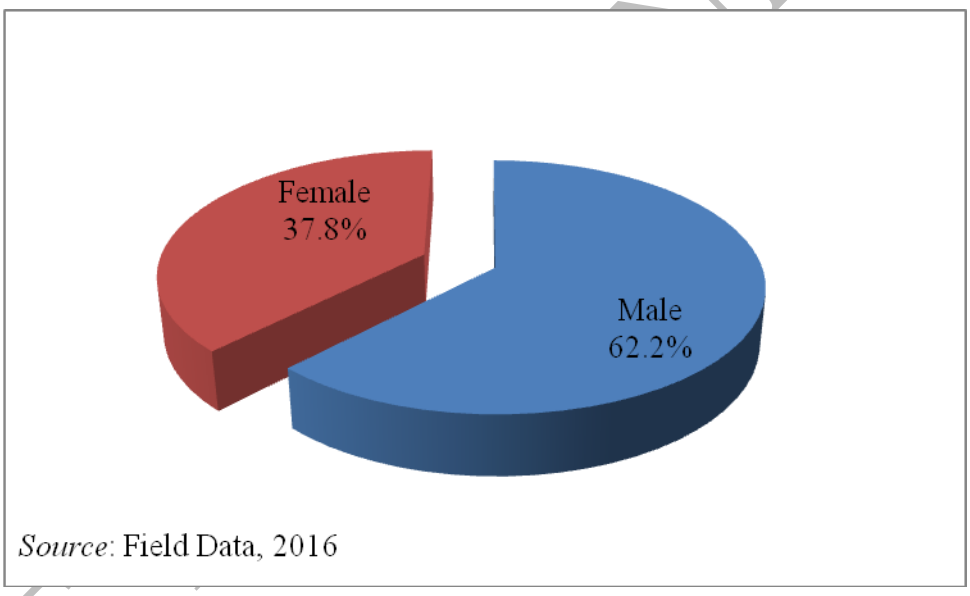


Figure 4.1. Gender Distribution of Respondents

This finding is also consistent with findings of Opondo (2013), Shabu and Tyonum (2013) Nyakundi et al, (2010) and Mwape (2009) whose studies were dominated by the male gender. For the present study, the findings could be as a result of the existing traditional system which recognizes the man as the head of the household, and therefore men were deemed responsible for answering the questionnaires.

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4.2.2. Age of the respondents

Respondents from 18 through to over 45ages were represented, with larger numbers in the 41-45 and lowest age bracket of 18-25. Accounting for 74(36.8%) and 60(29.9%) of the respondents, respectively. About 24.4% of the respondents were in the age bracket of 27-35 years while the least number of the respondents were aged 45 and above years accounting for only 9% (Table 4.1)

Table 4.1. Distribution of Respondents according to their Age Brackets

Age	Frequency	Percent
18-26 years	60	29.9
27-35 years	49	24.4
36-44 years	74	36.8
45 and above	18	9.0
Total	201	100.0

Source: Field data, 2016

Age of a household head plays a role in understanding the socioeconomic impact of flooding predicting its variability and to apply different coping mechanisms using indigenous knowledge

4.2.3. Marital Status

The study also enquired about marital status since it has a bearing on how individuals experience and cope with floods (Behrman et al., 2014). Figure 4.2 gives the distribution of respondents according to their marital status.

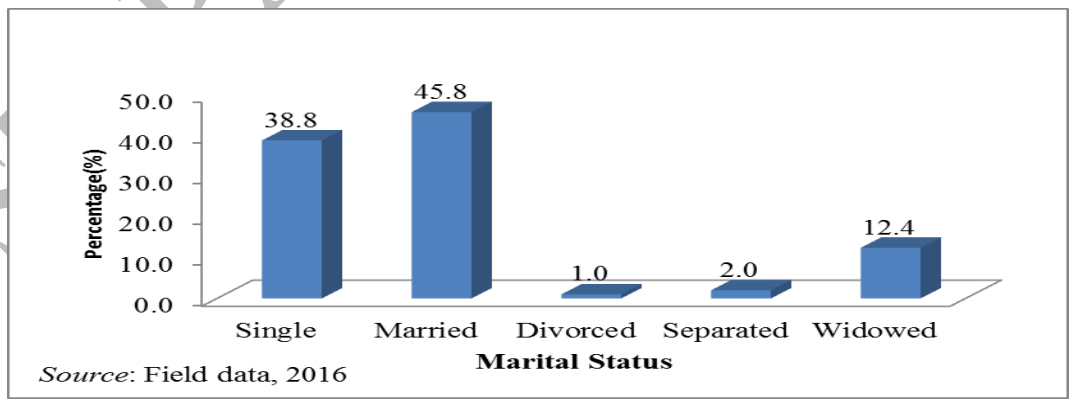


Figure 4.2. Marital Status

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As can shown in Figure 4.2, the highest category in terms of marital status was the married groups which accounted for 45.8 % while 33.3% were people describes as singles. About 12.4% represented the widowed while the rest 2% and 1% of the respondents were separated and divorced respectively.

This could be explained by the fact that households with both spouses are better financially and psychological placed and hence able to respond to flood risks in a better mental and emotional state than their single counterparts (Behrman et al., 2014). However this may not be necessarily true in all cases as shown by the various losses and destructions exhibited by most of the household including those who were married at the time of the study.

4.2.4. Level of Education

In regards to education, the data in Table 4.2 below showed that about 14.9% were illiterate particularly females (10.9%). Most of the respondents (27.9%) had primary education with most females forming the greatest proportion, 14.9% compared to their male counterparts (12.9%). About 21.9% had secondary education. However, this was dominated by males at 12.9% compared to only 9% females. In general, the findings showed that only slightly more than a third (35.4%) had gone beyond secondary school and among these, 25.4% had completed college education while only 10% had gone to university. The low levels of education could be as a result of high poverty levels and lack of motivation to pursue higher education. Cultural issues may also explain this trend where the male child is given first priority when it comes to education (Table 4.2).

Table 4.2. Levels of education

Level of Education	Male	Female	Total
No school	8(4.0%)	22(10.9%)	30(14.9%)
Primary	26(12.9%)	30(14.9%)	56(27.9%)
Secondary	26(12.9%)	18(9.0%)	44(21.9%)
College	45(22.4%)	6(3.0%)	51(25.4%)
University	20(10.0%)	-	20(10.0%)
Total	125(62.2%)	76(37.8%)	201(100%)

Source: Field data, 2016

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The level of education was expected to influence the way things are done in the household. The educational level of household members, therefore, plays an important role in decisions that are taken which could have implications for the socioeconomic effects of floods on the household. It is expected that people who are educated are likely to be financially stable and also more knowledgeable on variety of issues that will benefit the household especially in dealing with the effects of floods. The low education level of the respondents in this study is basically common feature of most of the rural households in Kenya (GoK, 2014). This may explain why most of the households are not able to deal with the effects of floods adequately. However, the government of Kenya supports education through varies initiatives such as free primary education; Constituency Development Fund (DCF); Higher Education Loans (HELB), many people in the rural areas are still illiterate or having low levels of education. This means that measures to encourage education and awareness in the study area should be embraced. Education is very important as it enables people to appreciate their environment and to take care of it. It also gives room for independency of thinking and in decision making.

4.2.5. Main Occupation and Monthly Income

The study revealed that the common occupations among the respondents was farming (31.8%) followed by business(27.4%) and formal employment (17.9%). 12.4% of the respondents were students, 7.5% were jobless,2% of the respondents indicated being involved in fishing and only 1% as housewife. Table 4.3 summarizes the findings.

Table 4.3. Distribution of Sources of Income (Occupations)

Occupations	Frequency	Percent
Farmer	64	31.8
Fishermen	4	2.0
Business	55	27.4
Housewife	2	1.0
Student	25	12.4
Formal employment	36	17.9
Jobless	15	7.5
Total	201	100.0

Source: Field data, 2016

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4.2.6. Monthly Income

The percentage distribution of respondents from Figure 4.3 shows that an approximately proportional distribution of wealth in the study communities. According to the figure, most of the respondents (37.8%) earned less than Kshs.5000. About 29.4% received monthly income of between Kshs.5001-10000, 25.9% received between Kshs.10001-20000 while an equal proportion of respondents, 3.5% had their earnings ranging between Kshs. 20001-30000 and Kshs. 30001 and above.

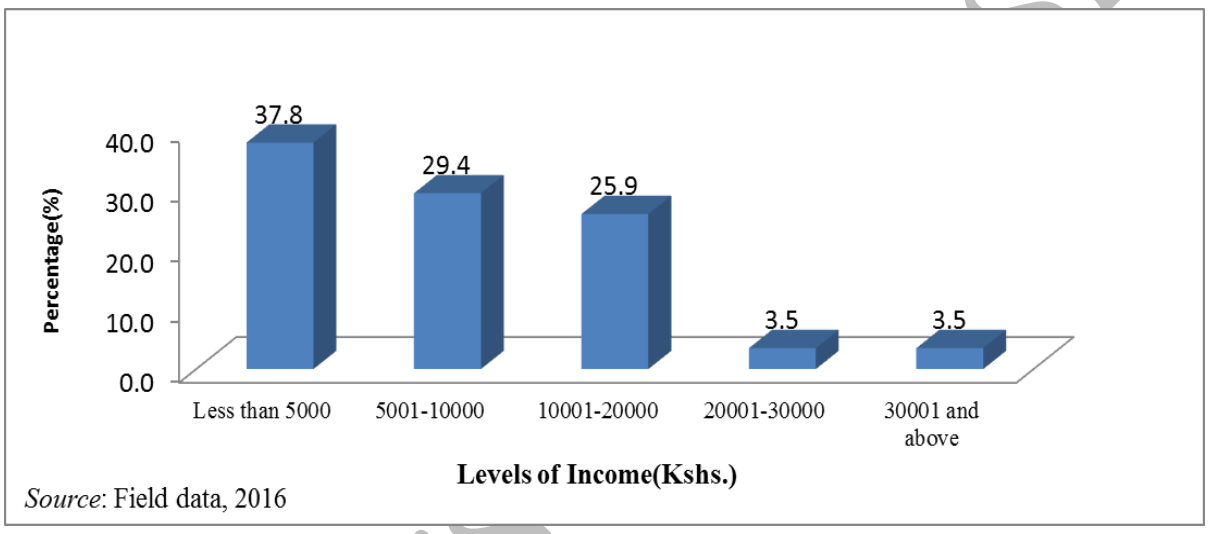


Figure 4.3. Levels of Monthly Income

The current findings imply that most of the household are low income earners. The low-income levels among the study population and especially the females may be attributed to low levels of education with only 35.4% having gone beyond secondary level. Low education levels are associated with lack of well-remunerated employment and therefore less social powers and fewer economic resources and physical capacity to anticipate, survive and recover from the effects of massive floods. Higher family income is of relatively greater benefit and often accompanied by a rise in expenditure on preparation and protection strategies (Dewi, 2007).

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4.2.7. Length of Residency

Table 4.4. Distribution of respondents according to their length of residency

Length of Residency in Years	Frequency	Percent
Less than 5	1	.5
5-15 years	20	10.0
16-19 years	32	15.9
20 and above years	148	73.6
Total	201	100.0

Source: Field data, 2016

Majority 73.6% of the respondents had been living in Nyatike Division for more than 20 years. Nearly 15.9 had residents for a period between 16 and 19 years 10years while a mere 10% had been residing in the area for 5-15. The smallest fraction 0.5% had been in Nyatike Division for less than 5 years (Table 4.4).

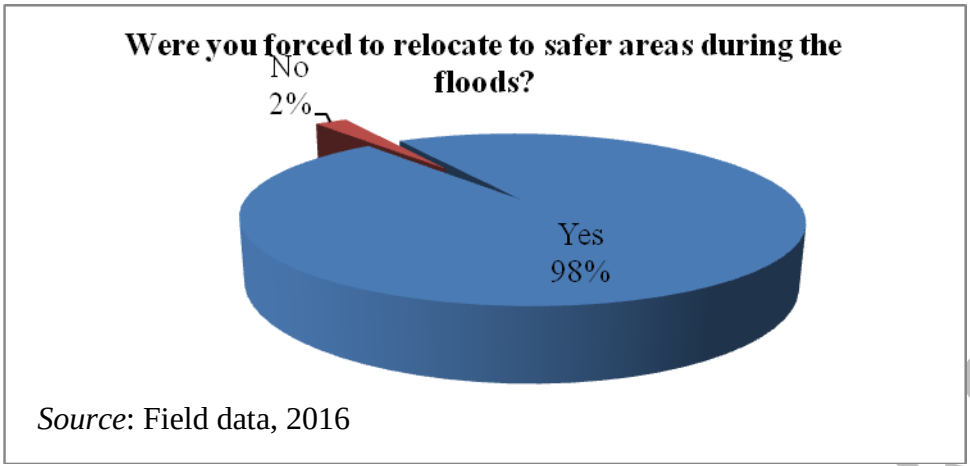
Nyakundi et al. (2010) findings on flood risk perception studies in rural and urban settings conclude that perception of floods and associated coping mechanisms is determined by many factors, most notably past experience of major floods and having survived them. In the current study, it is clear that most of the respondents have lived in the area long enough and therefore were in better position to respond to various questions related to effects of floods.

4.4. Effects of floods on the family ties in Nyatike Division, Migori County

One of the study aims was to examine effects of floods on the family ties in Nyatike Division, Migori County. To achieve this, the study first enquired whether the floods led to any relocation as shown in Figure 4.4.

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4.4.1. Floods and Relocation



Source: Field data, 2016

Figure 4.4. Whether respondents were forced to relocate to safer areas during floods

From the study, it appears that most (98%) of the respondents were forced to relocate to safer areas during floods. Only 2% indicated that they were not forced to relocate.

> *My children were not going to school. The small business I had also stopped because of the relocation* (Male Respondent, 2016)

Similar findings were reported by Opondo (2013) who observed that out 233 of the sampled households; more than a half (58.3%) had at least one or more members relocated temporarily to safer areas to avoid adverse effects of floods. In another study by Okayo et al., (2015), it was established that although most of the people were moved to safer areas, most of them were not willing to move to areas presumed to be safe.

4.4.2. Floods and Family Ties

The study also sought to assess whether floods had any effect on family ties. Therefore the following question was posed; in your opinion, do you think floods affect family ties?

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Table 4.5. Whether floods affect family ties

Response	Frequency	Percent
Yes	197	98.0
No	4	2.0
Total	201	100.0

Source: Field data, 2016

As shown in Table 4.5 above, most (98%) of the respondents were of the opinion that floods affect family ties compared to only 2% who were of the contrary opinion.

Further probing revealed that most of the households were affected by floods through eroding social assets such as neighborhood, friendship and brotherhood as well as strong bondage of kinship. The following quotes illustrate the findings.

> *I was forced to spend a week separately with/from my wife and children* (Male Respondent, 2016).
>
> *"It forces couples to spend far from others as some people reside in small camps or in schools"* (Female Respondent, 2016).
>
> *"You live away from your relatives and friends"* (Male Respondent, 2016)

The study also revealed that floods interfered or compromised the normal livelihood of most of the households. This fact is confirmed by one of the respondent who stated that: *a flood changes the usual living. People are now not on their daily duties.*

The current findings are consistent with that of Erickson (1976) which was based on the aftermath of the Buffalo Creek's flood in West Virginia. In the study, Erickson explained that neighborliness was not something that people could carry around with them to a new location. The findings also conform to that of Olawepo (2008) who also found that floods had significant impacts on family ties. The author explained that flooding may force people to new setting which tends to tear apart social fabric of existing communities and disrupt

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occupational undertakings of the community. In the current study, one of the respondents said, "*the small business I had stopped because of the relocation*."

4.5. Effects of floods on the health of people of Nyatike Division, Migori County

4.5.1. Health facilities

When asked whether there are health facilities in Nyatike Division, overwhelming majority indicated yes (99%) compared to only 1% who said there was no health facilities in the area. Figure 4.4 below displays the results.

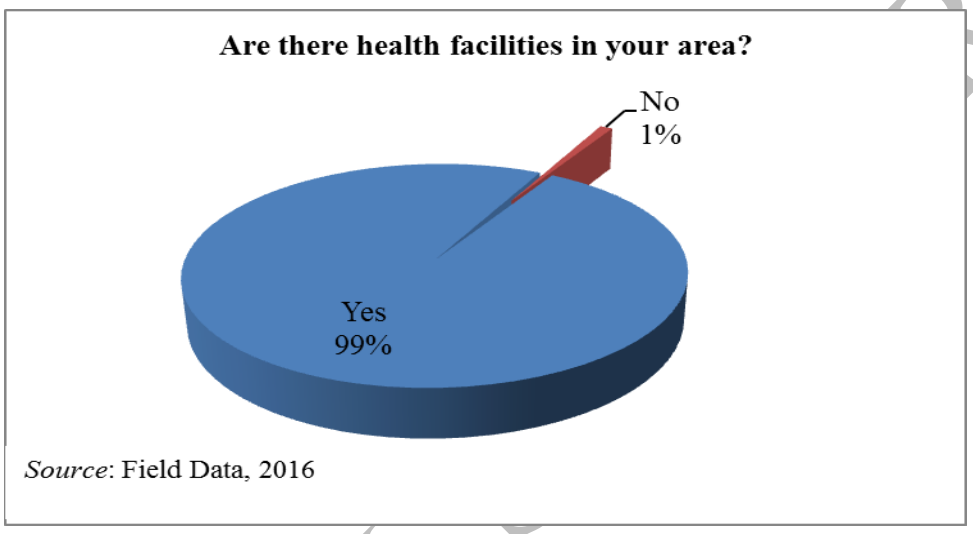


Figure 4.5. Whether there are health facilities in the area

The findings above reflect the country's commitment to provide health care services for majority of its citizens across the country. Since achieving her independence and self-government from Great Britain in 1963, Kenya has worked to improve the health of its nearly 40 million people, more than half of whom live in rural areas (GoK, 2014). By the late 1980s, the government of Kenya had more than quadrupled the number of health services/facilities serving to its growing population. Therefore it is not a surprise that most of the respondent disclosed that there were health facilities in the area.

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4.5.2. Disruption to health facilities

Table 4.6. Distribution of responses on the distribution of health facilities in the area

Response	Frequency	Percent
Yes	195	97.0
No	6	3.0
Total	201	100.0

Source: Field data, 2016

When asked to explain, Nyatike Division Health officer disclosed how means of transport and access to health facilities was affected. He also cited the inability of nurses to make to the health facility as a result of floods. Some of the quotes are illustrated below.

> "*There was no proper service due to poor infrastructure and no patients to attend to due to poor means of transportation*"
>
> *"Expensive means of transport; facility being water logged"*
>
> *"Nurses couldn't make it there when it rained due to mud and flooding water around the facility"*

4.5.3. Sickness among household members

The study also sought to establish if there were cases of sickness among members of the selected households. Table 4.7 summarizes the findings.

Table 4.7. Whether any household member got sick during floods

Response	Frequency	Percent
Yes	195	97.0
No	6	3.0
Total	201	100.0

Source: Field data, 2016

As shown in table 4.7, most households were affected by the floods as members got sick during the floods as revealed by majority 97% of the respondents. Only 3% of the respondents indicated that members of their households never got sick during the floods. Although there

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are not clear linkages between floods and occurrence of diseases in the study area, it is possible to conclude that members of the households got sick as a result of the floods. These findings may imply that floods may lead to ill health.

According to health experts interviewed, many illnesses experienced during flooding events are related to contact with unsafe water and intake of untreated water.

The current findings is similar to that of Rahman (2014) who revealed that out of the total number of household sampled, more than half of the disclosed that at least one of their household member got sick in the course of the flooding events.

4.5.4. Common diseases among household members during the floods

The study revealed that the most frequently mentioned disease among household members was malaria/fever (52.2%) followed by diarrhea (49.8%). About 45.8% and 21.4% of the respondent revealed that cholera and pneumonia were the common diseases among household members respectively. The study established that there were only few cases of bilharzias (5%) and skin rashes (2%). However, 3% of the respondents selected none of the diseases. Figure 4.6 gives details.

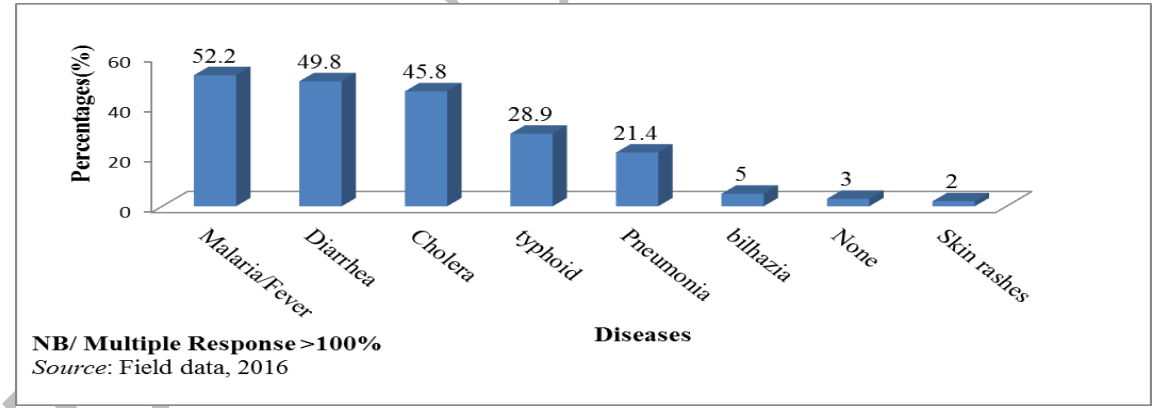


Figure 4.6. Common diseases among household members

The findings are similar to that of Theron (2007) who observed that floods was associated in the long-term, affected areas had to deal with the spread of infections and water borne diseases, cholera, dysentery and diarrhea which increased the need for safe drinking water and the provision of water purification tablets. The current findings are also similar to that of

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Rahman (2014) who also found the most frequently mentioned diseases as diarrhea and malaria.

Flooding can lead to the outbreak of epidemics, which usually happens weeks after the flooding event and the impact of flooding on water in particular could last up to six months (Hashizume et al. 2008). It was evident from the study that the there were some association between occurrence of floods and diseases. Data from the Key Informant Interviews revealed that personal hygiene and sources of drinking water for the household were the major triggers of various diseases especially diarrhea.

4.6. Effects of floods on household property in Nyatike Division, Migori County

4.6.1. Damage to household Properties

When asked if there was any damage to household properties as a result of floods, majority 96.5% of the respondents said yes compared to only 3.5% who said no. Table 4.8 below summarizes the findings.

Table 4.8. Response on whether there was any damage to household properties

Responses	Frequency	Percent
Yes	194	96.5
No	7	3.5
Total	201	100.0

Source: Field data, 2016

Similar findings were reported by Lee (2012) who observed that destruction to individual properties and the infrastructure of a given location/community. However, the author did not specify the type of natural disaster. It could have been earthquake, natural fires. The present study focused on floods. The study by Melsew (2014) also indicated that there were destruction to household properties particularly losses of their livestock.

Nott (2006) argues that physical damage to property is one of the major causes for tangible loss in floods. The author enumerates costs including damage to goods and possessions, loss

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of income or services in the floods aftermath and clean-up costs. In a similar note, Turtenwald (2013) explains that floods can hit a local economy hard. Residents who live in the area experience a financial burden in replacing lost items and fixing their homes. Businesses also suffer, not only from the loss of property, but the lack of customers during the flood and for a while after recovery. Farmers also suffer from the loss of their crops. Lee (2012) argues that natural disasters lead to significant damages to individual properties and the infrastructure of a given location/community.

According to Mohapatra and Singh (2003), floods have had adverse impact on people's lives and livelihoods. Similar observations have been made by Theron (2007) who contends that floods have several socio-economic and political implications which caused a wide range of complex issues. The author says that some of the immediate consequences included the destruction of infrastructure such as houses and roads, damage to farms and crops and loss of cattle and livestock.

4.6.2. Extent of damage

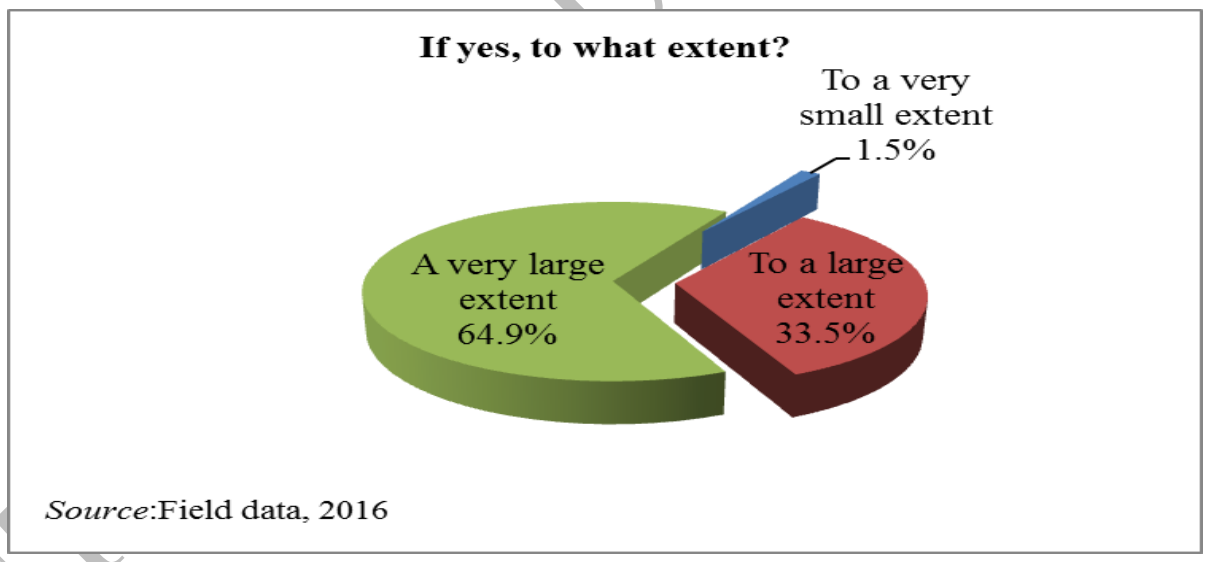


Figure 4.7. Extent of damage to household properties

As shown in Figure 4.7, majority (64.7%) of the respondent revealed that damage to their household properties was to a very great extent. Slightly more than a third (33.5%) of the

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respondents indicated it was to a large extent while a mere 1.5% said there was only a small extent of damage.

4.6.3. Damage to houses

The researcher also enquired whether there was any damage to houses as a result of floods. From the findings, majority (96.5%) indicted that indeed the houses were damaged as opposed to only 3.5% whose houses were not damaged. Figure 4.8 summarizes the findings.

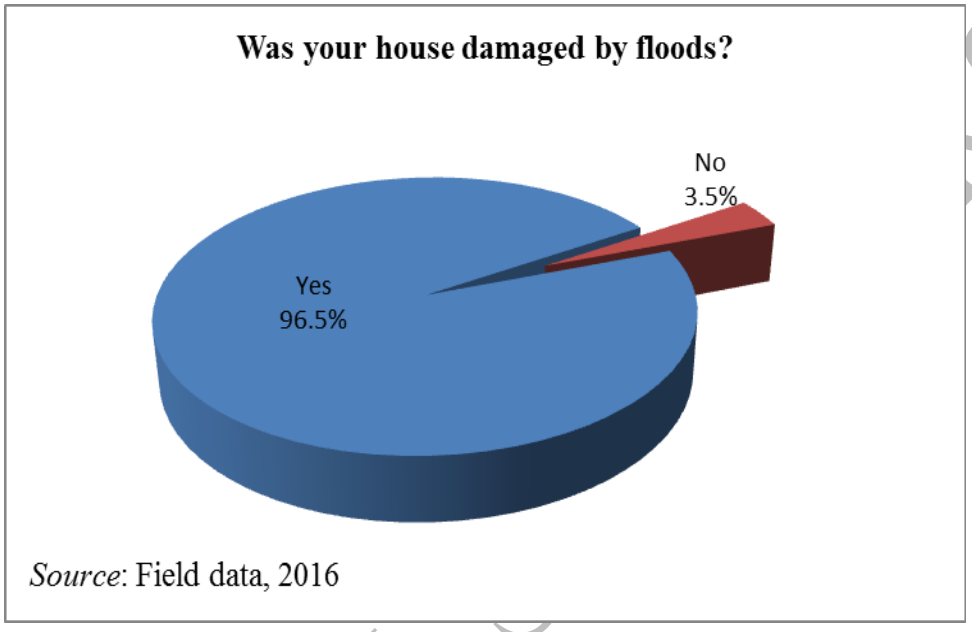


Figure 4.8. Destruction of houses in the study area

Further enquiries revealed that most of the houses developed cracks and others were carried away by the raging water/floods. The following quotes are illustrative of the findings:

"The wall of my house cracked and the whole house was swampy"

"The toilet soaked down and main house was broken by stagnant water bodies in my compound"

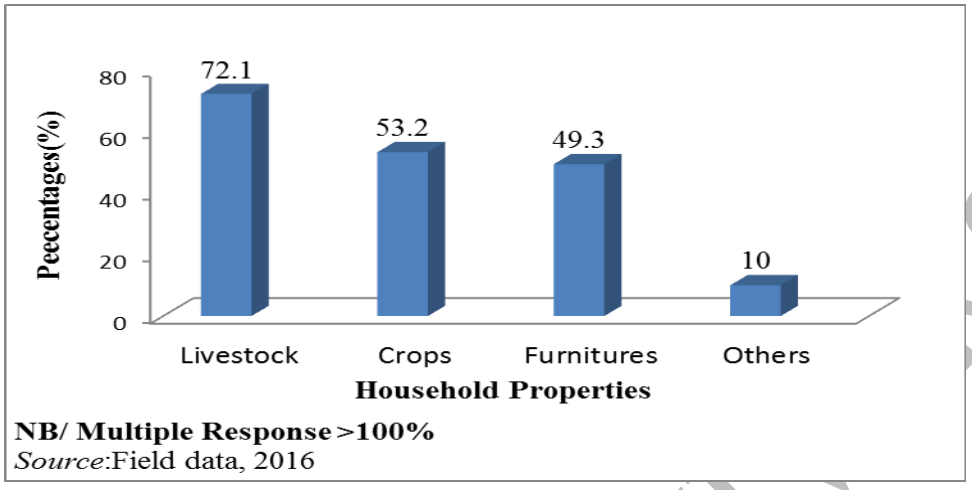
"Drowned by water to the river and lake"

When asked to mention the forms of household properties damaged or destroyed during the floods, majority 72.1% indicated livestock. This was followed by crops (53.2%) and furniture

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(49.3%). About 10% of the respondents mentioned other properties not included in the list such as utensils and beds as shown in Figure 4.9

4.6.4. Types of household properties destroyed during floods



NB/ Multiple Response >100%
Source:Field data, 2016

Figure 4.9. Forms of Household Assets destroyed during floods

The findings corresponds to a study carried by Mwape (2009)in Sikaunzwe community in Kazungula District of Zambia in which the author revealed that out of 300 households sampled 94% indicted that their crop fields were damaged by floods, 4% lost their fishing nets and majority of the population lost assets like beds, chairs and radios. The study by Melsew (2014) also indicated that there were destruction to household asserts especially livestock. Rahma (2014) also reported in this study that livestock was significantly affected by flooding events in Bangladesh where more than a half of the population dependent on their livestock as their supporting income source. Cow, duck, chicken and goat are several types of livestock at the study area. Some families from the study sample group totally depend on the income from their cattle farm such as milk and beef. The author observed that during the flood, the cattle and other household animals suffered lots of damage.

Livestock is of utmost importance for status, income, livelihoods, as well as survival of populations and cultures that are relying on livestock production. Livestock systems are a

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significant global asset which employs many people and support many livelihoods especially in developing countries (Thornton et al., 2006) .In the current study, the most affected aspect of household was livestock as cited by 72.1% of all the respondents interviewed. Perhaps, this is because most of the household sampled kept livestock.

4.7.1. Coping with effect of floods

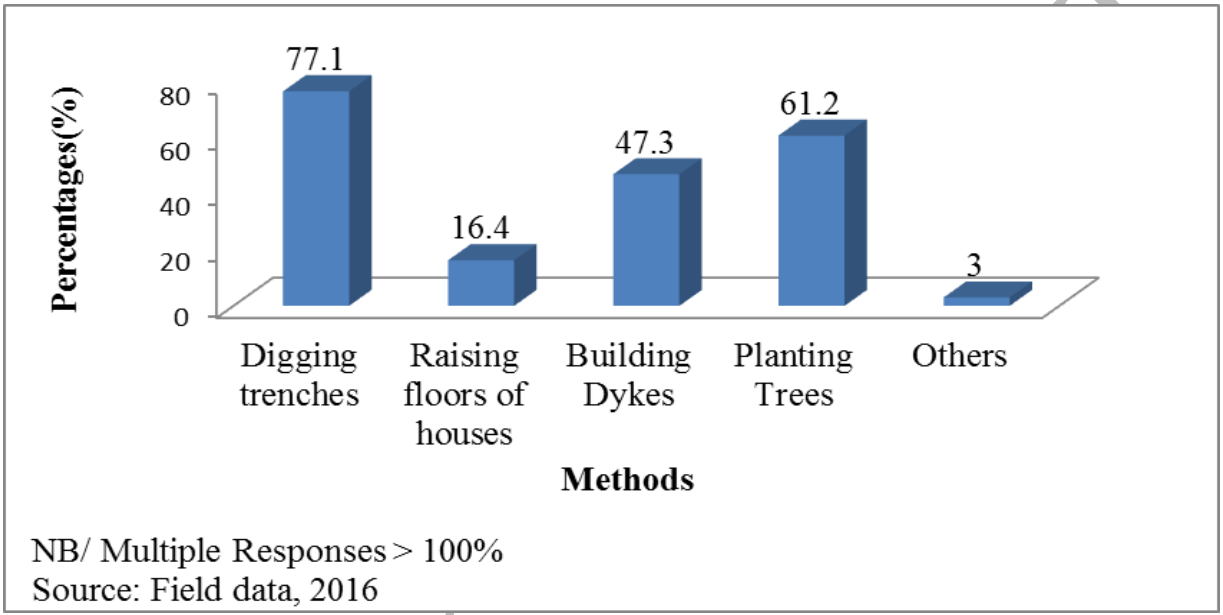


Figure 4.10. Different ways of preventing adverse effects of floods in the area

As shown in figure 4.10 above, the most common way of avoiding adverse effects of floods in digging trenches (77.1%) followed by planting trees (61.2%), building dykes(47.3%) and raising floors of houses(16.4%).

The above findings are similar to that of Shabu and Tyonum (2013) who assessed the coping measures adopted by dwellers living in flood prone areas of Makurdi town. Like the present study, it was observed that the main coping measures adopted among the study population included frequent sand removal of blocked drainages, creation of water channels and the use of sand banks. Similar findings were also reported by Attipoe (2014) in his research about the causes of flooding and effectiveness of flood controls to address the problem. The research found that storm drains had been constructed to prevent flooding in the study area, Alajo.

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4.7.2. Dealing with effects of floods

The study also enquired how households deal with effects of floods. Table 4.9 indicates that most (51.9%) of the respondents depend on Aids from the government and NGOs. About 39.5% buy food while only 8.5% seek alternative livelihood systems.

Table 4.9. Most Commonly used methods of dealing with effects of floods

Methods Used	Frequency	Percent
Buying food	79	39.5
Depending on Aids from the government and NGOs	104	51.9
Seeking alternative livelihood systems	17	8.5
Total	201	100.0

Source: Field data, 2016

4.7.3. Decision making in dealing with floods

When asked in the questionnaires to mention the member of household mostly responsible for any decision about way of dealing with floods, majority 85.6% of the respondents indicated husband, 9.5 % mentioned wife while 5% indicate other people such as eldest siblings or children and parents. Figure 4.11 gives further details.

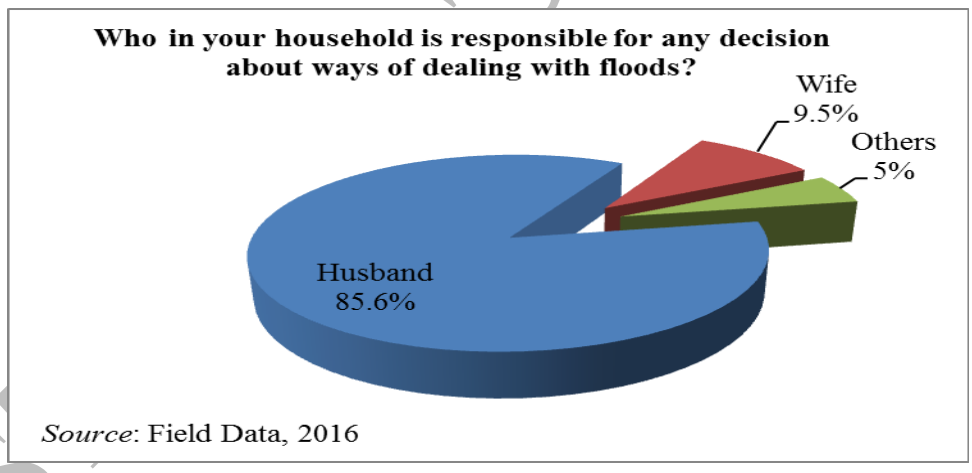


Figure 4.11. Members of household mostly responsible for any decision about dealing with floods

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The current findings is a confirmation of assertion made by Eriksenet al.(2005) who explain that gender plays important roles with regards to households' decision making about a given activity or coping strategy deemed appropriate in dealing with climatic stresses. In this study, males tend to play a bigger role in decisions about ways of dealing with floods. A good example is the absence of women taking part in some of the traditional activities. The current study is in contrasts to Bermoan, Quinn and Paavola (2013) who observed that during climatic stresses such as floods and droughts, older household heads tend to favour social support compared to the youths or younger households. Although the study relied on empirical data from Uganda; it gives useful insights on how ones age may affect his or her decision on the coping strategy to adopt.The current study specifically focused on socioeconomic effects of floods and explored some of the dynamic of coping mechanisms.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The present study set out to assess the socio-economic effects of floods in Nyatike Division, Migori County. In particular, this study aimed at exploring the following specific objectives

1. To examine effects of floods on the family ties in Nyatike Division, Migori County
2. To determine effects of floods on the health of people of Nyatike Division
3. To establish effects of floods on household property
4. To assess coping strategies used by households in response to floods.

This chapter present summary of the key findings, upon which conclusion and recommendations are drawn.

5.2. Summary of Key Findings

5.2.1. Socioeconomic Characteristics

The socioeconomic characteristics of the respondents are such that most of the respondents interviewed were males (Figure 4.1). Respondents of all ages (18 through to over 45 years) took part in the study (Table 4.1). Most of the respondents were farmers (Table 4.3) with low monthly incomes since only a small proportion were in formal employment (Figure 4.3).

5.2.2. Effects of floods on the family ties in Nyatike Division, Migori County

The study findings revealed that flooding has negative effects on family ties. This is because floods were associated with relocation where most of the respondents indicated they were forced to relocate to safer areas (Figure 4.4). Majority of the respondent disclosed that floods had affected family ties (Table 4.5). In particular, the study illustrated how flooding eroded social assets such as neighbourhood, friendship and brotherhood as well as strong bondage of kinship where most of the respondents were forced to spend separately with/from their loved ones, wife and children as well as friends.

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5.2.3. Effects of floods on the health of people of Nyatike Division, Migori County

The study established that there were a number of health facilities in the area (Figure 4.5). Unfortunately, most of these facilities were destroyed during the flooding. A big proportion of the study sample revealed that there was disruption to health facilities (Table 4.6). Respondent disclosed how means of transport and access to health facilities was affected. Others also cited the inability of nurses to make to the health facility as a result of floods. It was also established that most households had their members sick as a results of floods (Table 4.7). The most common diseases among household members were diarrhoea and malaria (Figure 4.6).

5.2.4. Effects of floods on household property in Nyatike Division, Migori County

General findings from the study revealed that there was destruction to household properties (Table 4.8). Most of the respondents indicated that the extent of damage was very large (Figure 4.7). A higher proportion of the respondents also reported that their houses were damaged (Figure 4.8). The study further established that most of the houses developed cracks and others were carried away by the raging water/floods. Livestock was the most affect aspect of household properties (Figure 4.9) perhaps this may be attributed to the fact that most of the households sampled kept livestock.

5.2.5. Coping strategies used by the households in response to floods in Nyatike Division, Migori County

The study also revealed that households employed various strategies to cope with the effects of floods. The most common way of preventing adverse effects of floods was digging trenches (Figure 4.10). The study found that most households depended on Aids from the government and NGOs as a method of dealing with effects of floods (Table 4.9). Lastly, the study disclosed that decisions about ways of dealing with floods were made by husbands (Figure 4.11).

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5.3. Conclusions

From the above summary of key findings, the following conclusions are made:

In this study, the respondents represent households/families which face various socioeconomic effects of floods. This climate based stressor emerges on top of a wide range of structural vulnerabilities, such as high poverty levels, limited livelihood opportunities, and low educational status. To make it even worse, the floods tend to tear apart the social fabric that out family and neighbourhood together. It also erodes social assets such as friendship and brotherhood as well as strong bondage of kinship.

The study also concludes that floods have adverse effects on health effects. In this study, several health facilities were either physically destroyed or were inaccessible. Also, there were increases in the number of stagnant water ponds. These factors lead to an upsurge of disease epidemics mostly associated with stagnant water such as malaria and diarrhoea.

Furthermore, the study concludes that floods destroy individual properties and infrastructure of a given location/community. From this study, it is quite clear how properties for most households were destroyed during the floods.

Finally, the study concludes that there are a number of ways in which households prevent adverse effects of floods and deal with effects of floods. In Nyatike Division, the common way of preventing negative effects of floods in the area is digging trenches and dykes. In addition, most of the households seem to rely on Aid from the government and NGOs.

5.3. Recommendations

Based on the above conclusions, the following recommendations are made:

1. Since floods in the area affect family ties, there is need for the Government and key Stakeholders to engage communities in their efforts to move permanently to safer areas. This may prevent other important members of the family from being left behind. Again, this relocation should be accompanied with all the necessary social amenities

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such as schools, hospitals, infrastructure, water and agriculture support for some specified period to enable the households settle. Consideration should also be made to introduce alternative livelihood strategies in the new area of settlements.

2. The Government should consider construction of dams to trap the excess water from river Kuja and Migori. This could be used for irrigation to improve food production in the area.

3. There is need for proper preparedness and a long term solutions to dealing with floods in the area. Digging trenches may not be the solution but there is need to find the root causes of the floods in the area. All people should be given equal chance to air their views on how to deal with the floods and that decisions about floods should not be left with males alone.

5.4. Suggestion for Further Research

1. The current study was limited to Nyatike Division. There is need to carry out similar study in other areas of the country especially those prone to floods. It would also be interesting to study how the community's response to disasters associated with floods especially in terms of the perception and behavioural responses to floods.
2. Assess factors affecting coping strategies used by the households in Nyatike Division

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APPENDICES

Appendix 1. Household Questionnaire

Introduction

Dear Respondent,

My name is Herine Akinyi Owuonda; I am a Master's student at St.Pauls University. This study seeks to understand socio-economic effects of floods in the households in Nyatike Division, Migori County. Your household has been randomly selected to participate in this confidential survey and your name and address will not be disclosed. Your response to this survey is very important, as it will provide valuable information about flooding in your community. You are hereby assured that your answers and opinions will be treated in the strictest of confidence.

Section A: Respondent's Profiles

Q1. Gender

a.[ ] Male

b.[ ] Female

Q2. Age

a.[ ] 18-26

b.[ ] 27-35

c.[ ] 36-44

d.[ ] 45 and above

Q3. Marital Status

a.[ ] Single

b.[ ] Married

c.[ ] Divorced

d.[ ] Separated

e.[ ] Widowed

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f.[ ] Others (specify)…….

Q4. Level of Education

a.[ ] No education

b.[ ] Primary

c.[ ] Secondary

d.[ ] College

e.[ ] University

Q5. Main Occupation

a.[ ] Farmer

b.[ ] Fishermen

c.[ ] Business

d.[ ] Housewife

e.[ ] Student

f.[ ] Formal employment

g.[ ] Jobless

Q6. Monthly Income

a.[ ] Less than 5000

b.[ ] 5001-10000

c.[ ] 10001-20000

d.[ ] 20001-30000

e.[ ] 30001 and above

Q7. Length of Residency

a.[ ] Less than 5yrs

b.[ ] 5-15 yrs

c.[ ] 16-19yrs

d.[ ] 20 and above yrs

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Q8. What is the size of your household? ……

Section B: The effects of floods on the family ties in Nyatike Division, Migori County

Q9. Were you forced to relocate to safer areas during the floods?

a.[ ] Yes

b.[ ] No

Q10. If yes, explain how your family affected by this relocation?

……

……

……

……

Q11. In your opinion, do you think floods affect family ties?

c.[ ] Yes

d.[ ] No

Q12. If yes, explain

……

……

……

……

Section C: The effects of floods on the health of people of Nyatike Division, Migori County

Q13. Are there health facilities in your area?

a.[ ] Yes

b.[ ] No

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Q14. If yes, were they affected in any way by the floods?

a.[ ] Yes

b.[ ] No

Q15. If yes, explain how they were affected

……

……

……

……

Q16. Was there any disruption in access to health services due to the floods?

a.[ ] Yes

b.[ ] No

Q17. Explain your answer

……

……

……

……

Q18. Did any of the household members get sick during the floods?

a.[ ] Yes

b.[ ] No

Q19. Out of the diseases outlined below, kindly tick against the ones which affected your household members.

a.[ ] None

b.[ ] Diarrhea

c.[ ] Cholera

d.[ ] Pneumonia

e.[ ] Malaria/ Fever

f.[ ]Typhoid

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g.[ ] Bilhazia

h.[ ] Skin rashes

i.[ ]Others (Specify)

Section D: effects of floods on household property in Nyatike Division, Migori County

Q20. Was there any damage on any of your household properties as a result of floods?

a.[ ] Yes

b.[ ] No

Q21. If yes, to what extent was the damage?

a.[ ] To a very small extent

b.[ ] A small extent

c.[ ] To a large extent

d.[ ] A very large extent

Q22. Was your house damaged by the floods?

a.[ ] Yes

b.[ ] No

Q23. If yes, explain

.....

.....

.....

Q24. Which of the following household properties were destroyed during floods?

a.[ ] Livestock

b.[ ] Crops

c.[ ] Furniture

d.[ ] Others(Specify)

Section E: The measures put in place to address socio-economic effects of floods in Nyatike Division, Migori County.

Q25. What major ways can be used to avoid adverse effects of floods in your area?

a.[ ] Digging trenches

b.[ ] Raising floors of houses

c.[ ] Building dykes

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d.[ ] Planting trees

e.[ ] Others……..

Q26. What are the most commonly used methods of dealing with effects of floods?

a.[ ] Buying food

b.[ ] Depending on Aids from the Government and NGOs

c.[ ] Seeking alternative livelihood systems

d.[ ] Others……

Q27. How did your household benefit from the above methods?

……

……

……

……

Q28. Who in your household is responsible for any decision about ways of dealing with floods?

a.[ ] Husband

b.[ ] Wife

c.[ ] Others……

<The End>

Thank You for your Time

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Appendix 2. Interview Guide for Key Respondents

1. Name----------
2. Organization……
3. Designation……..
4. Length of service in the organization
5. Highest level of education you have completed
6. History of flooding in Nyatike and the effects on the economy and development
7. How were the health facilities affected by floods in this area?
8. How has the community been affected health wise? Explain
9. How are the family ties affected by floods in Nyatike? Explain
10. To what extent is the destruction of household properties during flooding events in the Nyatike?
11. What types/forms of household properties are susceptible to flood destruction?
12. What are your roles in the management of floods? (Probe: how local authority respond to floods)
13. How do you believe flood decisions are made? Who is involved?
14. How does the community influence flood decisions?
15. What are the factors that have influenced the present decisions made on flood management?
16. What do you think would be the most important way to get better protection from flood risks?

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