

**COMMUNITY PERCEPTION STUDY ON THE IMPACT OF SHEBELLE RIVER
FLOODS ON LIVELIHOODS IN BALED WAYNE DISTRICT, HIRSH BELLE STATE
IN SOMALIA.**

AHMED MOHAMED EIMOI

**A Research Project Report Submitted in Partial fulfillment of the Requirements for the
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DECLARATION

This research project report is my original work and has not been submitted for award of degree in any other university.

Signature: 

Date: 10/11/2020

Ahmed Mohamed Eimoi

(C50/12978/2018)

Department of Geography and environmental studies

This research project report has been submitted for examination with our approval as university supervisors

Signature.....



Date.....10/11/2020.....

Dr. John M. Nyangaga

Signature.....



Date.....10.11.202.....

Dr. Shadrack M. Kthiia

Department of Geography and environmental studies

University of Nairobi

DEDICATION

It is with great humility and thankfulness that I dedicate this project to my beloved family, especially my mother and father for their unrelenting support and cheerful engagement.

ACKNOWLEDGEMENT

All praise be to Allah the Almighty for his grace that has granted me the ability to finish this project. I am so much endeared to my lovely parents for their help and encouragement that have enabled me to make this achievement. I acknowledge the contributions and the endless support of my supervisors; **Dr. J. M Nyangaga** and **Dr. S. M. Kithiia** whose effort and guidance saw me complete this project successfully.

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LIST OF ABBREVIATIONS

AWD	Acute Water Diarrhea
DRC	Danish Red Cross
EU	European Union
FOA	Food Agriculture Organization of the United Nation
FGS	Federal Government of Somalia
FSNAU	Food Security and Nutrition Analysis Unit
HDI	human development index
IDNDR	International Decade for Natural Disaster Reduction
IDP	Internally Displaced Person
ITCZ	Inter-Tropical Convergence Zone
MDGs	Millennium Development Goals
OCHA	Office of Coordination of humanitarian affairs
OPM	Office of the Prime Minister
PDNA RP	Post Disaster Needs Assessment and Recovery Plan
SC-UK	Safe the Children- UK
SWALIM	Somalia Water and Land Information Management
UN	United Nations
UNEP	United Nations Environment Programme
UNICEF	United Nations Children Education Fund
WFP	World Food Programme
WHO	World Health Organization

GLOSSARY OF TERMS

Deyr	Minor Wet Season that lasts from October to November
Gu	Major Wet Season that lasts from April to June
Hagaa	Minor Dry Season that lasts from July to September
Jilal	Major Dry Season in Somalia that lasts from December to March

ABSTRACT

This study looked at community perception on the impacts of Shebelle River floods on livelihoods in Baled Weyne District in Somalia. There is minimal research on the extent of the effects of Shebelle River flooding on community development in Baled Wayne hence this research sought to investigate more on the extent of these. The objectives of the study were as follows: to study into the causes of River flooding in Baledweyne district, to understand how river floods affect the socio-economic state of the residents and to investigate the coping mechanisms practiced by the local people around Baledweyne district during floods. A sample size of 397 respondents was extracted from a population of 55,410 using Sample Size Calculations for Slovene's formula, and data was collected using the descriptive research design from 397 respondents through the use of self-administered questionnaires data collection instrument. The data was analyzed using graphs and pie charts, aided by the Statistical Package for Social Sciences version 20 and data was presented using tables.

The findings of this study showed that the heavy rains that come from high land of Ethiopia, lack of control structures of river banks and deforestation causes of Shebelle River flood in Baled weyne. The respondents indicated that the flooding of river Shebelle causes loss of lives, damage of infrastructure, increase of mass migration and a decrease in farm productivity.

.Each year, rains are predicted for April – June with potential flood risks in Beled weyne, Hirshabelle among other areas in the country. In order to mitigate this upcoming disaster, the following recommendations such as flood water diversion, Preparation before flood coming and Re-establishing River Management Authority.

CHAPTER ONE INTRODUCTION

1.1 Background of the Study

Overall River flood occasions represent almost 50% of the deaths and 33% of all financial misfortunes from normal perils around the world (Maduakolam et al., 2019). Somewhere in the range of 1985 and 2005, river floods killed more than 112,000 individuals, influenced in excess of 354 million individuals and caused around 520 billion Euros (US\$690 billion) in money related harms in Africa (Ipyana, et al., 2019). The event of extreme flood occasions has expanded discernibly throughout the most recent years, influencing millions of individuals and hampering monetary advancement in the locale, applying colossal weight on the influenced nations. Along these lines, significant exertion has been placed into the relief of flood-prompted harms in Africa in the course of the most recent decade (Kundzewicz, 2013).

River floods in Somalia are a common phenomenon. The river floods occur mainly during the rainy seasons from April to June and from October to November. The river floods cause large casualties and economic effects in Somalia (Montani, et al., 2002). The Potential for loss of life and property increases as the population tends to increase year after year (Gadain, et al., 2016).

Flooding of the Juba and Shebelle rivers is expected basically to discordant climatic changes and inconsistent anthropogenic cycles. Floods typically happen during the stormy period of Gu (April to June) and Deyr (October to December) and it is within this time that the progression of the rivers is most noteworthy. This is additionally when substantial rains fall inside the catchment zone of all the rivers found in the Ethiopian Highlands (Gadain, et al., 2016).

In Somalia, the floods of 2000, 2002, and 2005 were of a shorter span. These floods were brought about by hefty and moved precipitation in the upper catchments of the two rivers. The issues in flood fields were disturbed because of penetrate in the dykes between 1997 and 1998 flooding that had not been fixed. The most perceptible was the Gu 2005 flood. This season witnessed multiple flooding in numerous riverine zones regardless of that precipitation in southern part of the country because the season was normal and beneath normal. The 2005 Gu

season floods were essentially because of the substantial rains that had been received in the Ethiopian highlands on the catchments belonging to the two bowls (Abdullahi, 2017).

1.2 Statement of the Problem

Flooding is a significant natural phenomenon making serious effects on the financial and ecological parts of human undertaking. It is unmistakable in exceptionally developed and low-lying territories particularly where practically zero consideration was paid to and absence of legitimate arranging in the improvement of frameworks (Kimei, 2013). Somalia encounters two kinds of flooding; river floods and blaze floods. River floods happen along the Juba and Shebelle rivers to the South of Somalia, though streak floods are common phenomenon along the discordant streams in the northern areas of the nation (Gure, 2018). Baled Weyne is faced with a number of environmental challenges and flooding is one of such challenges. Baledweyne which is located in a low-lying and flood-prone area receives the greatest impact of these frequent floods. The people in Baledweyne do not have the capacity to control the hydrological events from the Ethiopian highlands. Moreover, there is minimal research on the extent of the effects of river flooding on community hence this research sought to investigate more on the extent of these effects based on already collected data, any previous academic writing and what the people of the Baledweyne have experienced in the most recent years.

This research generated data of on the community perception study of on the impact of Shabelle River floods on livelihood in Baledweyne District, Somalia. The problem of frequent flooding of River Shebelle should be urgently addressed reason being that these floods have wide and great negative effects on the livelihoods of the community living in Baledweyne District; economically, socially, and the fact that the transport system is frequently interrupted due to destruction of roads and bridges, access to clean water is limited due to increased water pollution when these floods go beyond the river and other effects that was evident throughout the study. Therefore, it was prudent important insights into the flooding of River Shebelle.

1.3 Research questions

1. What are the causes of constant flooding in Baledweyne?
2. What are the socio-economic effects of floods in the Baledweyne community?
3. Are there any existing coping mechanisms in place to curb the negative impacts of River flooding?

1.4 Objective of the study

The primary objective of the study was to assess the causes of Shebelle River floods and its effects on community livelihoods in Baledweyne District, Hirshabelle state, Somalia

1.5 Specific objectives

1. To study into the causes of River flooding in Baledweyne district.
2. To understand how river floods affect the socio-economic state of the residents.
3. To investigate the coping mechanisms practiced by the local people around Baledweyne district during floods.

1.6 Justification of the study

Universally, urban communities in creating nations are progressively inclined to flood hazard, especially in socio-monetarily denied territories (Ambuchi, 2011). Flooding is the most incessant and boundless debacle on the planet with huge loss of life and financial misfortune (Kimei, 2013). Baledweyne is a flood-inclined area with authentic records of floods in 2000, 2002, 2013, and 2018 were of shorter length. Baledweyne which is located in a low-lying and flood-prone area receives the greatest impact of these frequent floods. The people in Baledweyne do not have the capacity to control the hydrological events from the Ethiopian highlands. Moreover, there is minimal research on the extent of the effects of river flooding on community development hence this research sought to investigate more on the extent of these effects based on already collected data, any previous academic writing and what the people of the Baledweyne have experienced in the most recent years. This research generated data on the perception study of community of Baledweyne District to the impacts of Shebelle River floods in Somalia. The problem should be

urgently addressed reason being that these floods have wide and great negative effects on the livelihoods of the community living in Baledweyne District; economically, socially, and the fact that the transport system is frequently interrupted due to destruction of roads and bridges, access to clean water is limited due to increased water pollution when these floods go beyond the river and other effects that was evident throughout the study. This study aimed at investigating the extent of the effects of river flooding on the various aspects of the livelihoods of the people of Baledweyne District as highlighted, in a bid to attempt to propose any measures that could be taken to avoid or mitigate these negative effects.

1.7 Scope and Limitation of the study

The study sought to study the effects of River Shebelle flooding. The study did not consider other rivers because of the huge financial implications that such a study would have implied on the researcher. Thus, the research concentrated only on River Shebelle.

The primary limitations of this study were: first, the interview was structured by the researcher; secondly, extraneous variables were beyond the control of the researcher, such as issues to do with honesty and biases from the respondents. Finally, there was a language barrier that affected how the respondents responded to the questionnaires. To make sure that the study was valid, the researchers translated the questionnaires into the Somali language.

1.8: Definition of Key Terms

Floods: Floods are normally high paces of release and additionally water levels, regularly prompting immersion of land nearby rivers and stream (Kimei, 2013).

Hazard: A hazard is a perilous marvel, substance, or human influence that may cause death, serious injury, and ecological harm (Swlim, 2011).

River flood: When the release of a river builds, the channel may turn out to be totally full. Any release over this level will bring about the river flooding its banks and causing a flood.

A Disaster: A catastrophe that disturbs the natural balance of a community or society, leading to negative effects.

Vulnerability: This is powerlessness to the negative outcomes coming about because of a catastrophic event. The numerous sorts of vulnerability incorporate physical or material vulnerability (lodging, foundation), social/hierarchical (social imbalance, institutional limit), and inspirational/attitudinal ("can-do" demeanor versus resignation).

Community development: Community development defines where community individuals meet up to make aggregate moves and provide answers for common problems.

Metropolitan flooding: Urban flooding can be defined as the immersion of land or property in areas that are inhabited, especially where the precipitation exceed s the limit if drainage systems.

Catchment/watershed/basin: is the zone covering all the land that contributes overflow water to a typical point. At the end of the day, it is a degree of land where water from downpour or snow dissolves drains into a waterway, for example, river, lake, store, ocean or sea.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter tried to present an overview of the theoretical literature and related empirical studies. The purpose of the literature review is to assess the empirical materials related to the study and to understand important demographics related to the study. The literature review also identified the gaps, inconsistencies, and conflicts that may be in previous researches. The literature reviews also provided essential foundational knowledge on the topic of study.

2.2 Disaster of Floods

A flood is a body of water that covers land which is normally dry. Floods are common natural disasters that can affect millions of people around the world. They destroy houses and buildings, and carry soil away from valuable farming land. Floods can also contaminate drinking water and lead to diseases. They are often caused by rivers, but overflowing lakes and seas can also cause flooding. Also Flooding is often thought of as a result of heavy rainfall, but floods can arise in a number of ways that are not directly related to ongoing weather events (Abdulle, 2020).

There is persuading proof that the number and reality of disasters are expanding in both created and creating countries and helpless nations and networks are lopsidedly influenced. In the course of the most recent two decades, more than 1.5 million people have lost their carries on with because of grievous occasions. While just 11% of the total populace presented to common hazards live in nations with a low Human Development Index (HDI), these nations alone record for 54% of the deaths. Then again, nations with a high HDI speak to just 15% of the total populace and record for 1.8% of deaths brought about by catastrophic events. It is assessed that during the most recent couple of decades, a normal of 250 million people have been influenced every year, with about 58,000 deaths and more than \$67 billion in misfortunes because of disasters brought about by common hazards. In 1990, 90 million people endured the effect of disasters, contrasted with 255 million out of 2003. Somewhere in the range of 1990 and 2003, an aggregate of 3.4 billion people overall endured the results of disasters (Ambuchi, 2011).

In Somalia every year people around river area are facing flood devastation that can cause displacement of farmers and ordinary people, economic lost, lack of crop production. There are two opposite phenomena in Somalia, drought and flood. Somalia has suffered from severe floods on a regular basis, with the most severe in 2006, 2011 and 2012. For this reason the humanitarian agencies are keeping a close eye on events in Somalia today (WHO, 2013).

In the past decade, Somalia has experienced recurring floods and droughts. The 2011 East Africa Drought resulted in the death of a quarter million individuals, half of whom were children under the age of five, as well as the displacement of nearly 1 million individuals. In 2016/17, the country experienced another large-scale drought, leaving an estimated 6.7 million individuals in urgent need of humanitarian assistance (Fan, 2013). In 2018, Somalia also experienced major flooding, which further displaced over 230,000 individuals, worsening the impact of the 2016/17 drought. Somali is seen as one of the most unstable countries to climate change in the world, the intensity and frequency of climatic events facing Somalia is expected to increase in the coming years. In addition to these disaster risks, Somalia is still confronting significant political insecurity risks and capacity constraints due to more than two decades of conflict (World Bank, 2020).

Flooding of the Juba and Shabelle rivers are due primarily to climatic and anthropogenic processes. These natural floods are due primarily to drainage from catchment areas located in the Ethiopian highlands, which normally experience heavier than normal and more frequent precipitation than occurs in Somalia While artificial flooding of agricultural land is largely due to illegal manmade openings on the dikes and high natural embankments to create an outlet for irrigation water in the dry season.

The 2019 UN Floods Response Plan reported that nearly an additional USD 50 million is required for the immediate flood response, while approximately USD 20 million had been released from the United Nations Central Emergency Response Fund and Somalia Humanitarian Fund to provide life-saving humanitarian assistance. On 29 October 2019, the Prime Minister of Somalia triggered the release of USD 500,000 of emergency funding to respond to the floods (FGS, 2020).

2.3 Causes of flood

Floods happen because of the quick collection and arrival of overflow waters from upstream to downstream, which is brought about by weighty precipitation. The overflow waters rapidly arrive at a most extreme and lessen quickly (Phillip A. , et al., 1987). Floods additionally happen because of stream of a stream turning out to be incredible until it surpasses the size of its channel and thus floods its banks (Ang'awa, et al., 2007). A flood basically can be portrayed as water flooding onto normally dry land. Flooding generally is because of hefty precipitation; by and by floods can happen in differing ways that are by implication identified with current climate occasions. Consequently an absolute clarification of flooding should grasp rehearses that may not legitimately be identified with meteorological occasions.

Floods consistently affect Somalia, and specifically along the courses of the Juba and Shabelle Rivers in the southern aspect of the nation. The downstream portions of these rivers are set apart by a backwards geography, with courses of water at certain areas on higher rise than the contiguous land; subsequently, the lower portions of the river floodplains are profoundly vulnerable to flooding (Chen, et al., 2015) . Parched and semi-dry land away from the principle river courses additionally experience streak flood occasions (Abdullahi, 2017).

Floods are brought about by numerous components, for example, massive precipitation, over-melted snowmelt, extreme breezes over the water, surprising elevated tide, waves, or breakage of dams, levees, artificial lakes, and other structures that held the water. In other manner, flooding can be reduced by increasing the sizes and scope of the hard ground spread that doesn't permit the water to pass careful just as by other characteristic hazards, for example, fierce blazes, which decrease the flexibly or the measure of vegetation spread that can assimilate precipitation (Kimei, 2013).

Indicated that floods may happen because of meteorological or other causes, which can exacerbate the occurrence of flooding to Meteorological causes include snowmelt, rain, and combination of rain and ice melting. The storm around the Coastal region increases, and the interactions between the stream flows and other climatic conditions become discordant (Ayele, 2018). The remaining causes of floods are as a result of natural hazards, such as earthquakes,

landslides, Tsunamis and hurricanes or human-related (technological) dangers, such as dam breaks, fail levees, dykes, weirs and terraces (Delunzu, 2015).

River floods in Somalia are a result of far reaching devastation of life and property that credited to hefty rains in the upper pieces of the Ethiopian highlands Somalia. The rivers in Somalia have two seasons of floods, the Gu and the Deyr, mirroring the region rainfall designs. The two stormy seasons are identified with the southwards and northwards section of the Inter-Tropical Convergence Zone (ITCZ) around the Ethiopian Highlands. The Gu season extends from April to around June, while the Deyr season extends from September to around December. Compared with the Deyr seasons, the Gu season is the main stormy season with over half of the yearly rainfall. It can likewise be seen that albeit 25-30% of the downpour falls during the Deyr season in inland zones of the basins, the southern zones close to the coast don't get a lot of downpour in this season (Swalim, 2007).

River Flooding along the Juba and Shabelle Rivers are expected basically to climatic and anthropogenic processes. These regular floods are expected essentially to drainage from catchment territories situated in the Ethiopian highlands, which typically experience more rainfall than ordinary and more successive precipitation than what happens in Somalia. While counterfeit flooding of horticultural land is to a great extent because of illicit artificial openings on the dykes and high common dikes to make an outlet for water system water in the dry season. Prior to the Civil war, basic measures to avoid and manage floods included development of dykes, blasts and flood help channels. These guideline structures are in deterioration and not, at this point dependable. In the midst of high water level in the river, the water, which through some way or another stream down the river without causing any damage, discovers out through the synthetic openings and immerses huge agrarian terrains (Swalim, 2009). The river stream inside Beledweyne catchment is commonly diminishing from upstream areas to downstream areas toward Buluburte. Severe flood level of Beledweyne station is approximately 320 m³/s with river water level at approximately 7.0m.

2.4 Flood impacts

The effect of flooding generally refers to the various types of harms and hazards that come along with the flooding occurrences. The effects of flooding range from physical, economical, and emotional, affecting the day to day livelihood of residents. Other effects of flooding include ecological, environmental, and economical (Okwu, 2015).

Flooding was the primary driver of displacement in Somalia between October and December, 2019, impacting 370,000 people between October and November and nearly 410,000 from October through December (PRMN 2020). Conflict further displaced an additional 32,000 people, while drought and other causes displaced 26,000 people during the October to December period caused by heavy rains and flooding contributed to damaged infrastructure, including shelter and latrine (FGS, 2020).

Loss of life: one of the most significant characteristics of floods around the Shabelle and Juba rivers is the runoff of excess waters that are generated from the upper catchments of Ethiopia which receives high rainfall than the lower parts of the island. The flood catches the residents living in the downstream unawares, leading to massive loss of lives and displacement of people (FAO, 2007). As a result of the flooding, health facilities have been damaged and essential health services, such as immunization services and vector control activities, were suspended. WHO requested additional support of US\$ 1.38 million to further scale up and sustain its current surge operations in flood-affected districts, targeting 450,000 beneficiaries of the most affected populations with essential and life-saving health interventions for the next three months at least 10 health facilities were reported by WHO to have been destroyed in the flood, while IPSOS reported 15 facilities to be impacted, thereby depleting health services in the affected districts (WHO, 2020). Floods contribute to diseases such as Acute Watery Diarrhea (AWD) and other serious outbreaks that sometimes transcend the borders. Somalia remains susceptible to disease outbreaks mostly due to deprived health conditions, and as the flood standing water takes long to recede, they are likely to continue to intensify disease outbreaks. Somalia has encountered a huge scope flare-up of cholera since the start of 2017. Since December 2017, an average of 9613 cases, including 50 deaths (CFR 0.5%), were accounted for from 3 conditions of Somalia (Hirshabelle, Jubbaland and South West state) and Banadir locale. By mid-December, an

aggregate of 126 new instances of cholera and two deaths were accounted for from 11 regions of Banadir area. No case was accounted for from different territories (Bank, 2019).

Livelihood Loss: As the greater part of the cultivating networks live and get their jobs from exercises that occur along the course of the rivers, flooding occasions lead to obliteration. In most of the low-lying regions around the rivers the immersion goes on for a considerable length of time and now and again months prompting all out loss of harvests. Floods often match with the seasonal development time frames for example Gu or Deyr seasons (Swalim, 2008). Floods in the low-lying territories cause harms to edited zones, uprooting and loss of assets. In any case, flooding can in certain locales along River Juba carry benefits by tackling to help downturn agribusiness in discouraged territories in the flood plain (FSNAU, 2013).

Infrastructure sway: Effective activity and upkeep of the water system infrastructure fundamentally added to flood decrease, as immense amounts of water were removed by the waterways into the water system lands, huge numbers of which worked viably during high river streams. Before the breakdown of government, networks had the option to set up adapting procedures utilizing customary techniques for strengthening of dikes and restoring waterways. The purposeful breakage of dikes to flood the discouragements for downturn trimming can now and then lead to massive flooding and clashes with those whose jobs (downpour took care of development) and property are harmed, for example roads courses, human settlements, open infrastructure, and even waterways (Swalim, 2007).

Significant harms on road infrastructure have been affirmed in such structures as: washed away road areas, disintegration on road shoulder and paths, washed away surface and sub-surface asphalt materials, obstructing and disintegration of drainage, and road block-age by trash. Road structures were likewise vigorously affected; including washed away extensions and approaches; harmed or obstructed ducts, floats and upsets; washed away or harmed auxiliary infra-structure, for example, watch rails, wall, signs, road lights, and traffic signals. Roads that associate towns and towns in these locales have been seriously harmed because of the weighty downpour, immersion, and the progression of water and trash (FGS, 2020).

Flooding greatly affects the manufactured environment impressively, the same number of structures and structures are influenced by the floods. In Beledweyne, both finished and

uncompleted structures and structures are surrendered because of dread of what is presently a yearly event. The fundamental Bridge in Beledweyne area is influenced by the floods. This causes traffic and blocks development of inhabitants as the scaffold is delivered distant. Pathways are additionally flooded and for the most part driving is practically outlandish in the event of floods. This in a roundabout way influences daily activities of occupants just as significant interruptions in the lives of p people and organizations (Nishat, et al., 2000).

According to local residents in Baledweyne district, the year 2019 flood had the biggest magnitude in the history of Baledweyne and had left huge impact people's lives and property. The residents agreed unanimously that it has no comparisons whatsoever floods of this scale has never happened and that it's impacts surpassed the 1981 floods which as long as anyone in Baledweyne remembers had been the worst known floods. It had caused loss of several human lives, huge livestock death and destruction of other valuables assets and properties such homes, food stocks, business goods, public and private infrastructure and has led to massive displacement of residents from their homes into IDP settlements in a bare and rocky lands in the Western and eastern outskirts of Baledweyne district. Swalim estimates that floods in Hirshabelle state led to the loss of 10,000 hectares of cropland in Mahaday Weyne and in Jowhar. OCHA is working with authorities and humanitarian partners to scale up the response (Abdulle, 2020)

In Hiiraan it is reported that 70% of town latrines have been destroyed. Floods by and large create over a time of days, when there is an excess of rainwater to fit in the rivers and water spreads over the land straightaway. Beledweyne town however Shebelle River The normal progressions of the Shebelle River at Beledweyne Station is 75 cubic meters (75,000 liters') every second (FAO and Swalim, 2007) The Shebelle River basin is bigger in size and the Shebelle River is longer compared to Juba River, yet Shebelle River is low in yearly spillover contrasted with Juba River due with climatic and topographical catchment conditions (Abdullahi, 2017).

Education: In Beledweyne six schools were badly affected by the floods and have stopped functioning. The other schools were suspended for a while and were about to resume at the time of the assessment Education kits consisting of reference materials and stationeries were

destroyed. A number of schools (including Bundaweyn and Heegan) have been occupied by IDP and were closed. Since there were no schools in the new IDP sites, majority of the school going children have resorted to stay indoors and learning was suspended indefinitely. The affected schools need to be rehabilitated and the ones occupied to be evacuated by the IDPs Education kits consisting of reference materials and stationeries to be replaced (UNICEF, 2012).

In the region of Beledweyne, in focal Somalia, a river flooded and at any rate 10 people passed on when a vessel overturned attempting to safeguard abandoned occupants. Schools have been compelled to close their entryways because of flooding, while the rising waters additionally made harm structures and broad interruption. Instructors have been compelled to escape to higher ground where help organizations are giving life-sparing help, including cover, to a fourth of a million people. A complete of 86 schools have been influenced by the floods. Around 700 instructors are additionally unemployed as local people escape to higher ground because of floods in Beledweyne region and encompassing areas (OCHA, 2019).

Market In Beledweyne Markets continue to function normally and are fairly integrated with other regions of Somalia. Commodity Supply routes and the flow of trade goods into and out of Beledweyne district remains the same as before the floods. Most of the commercial import goods including food stuffs come to Beledweyne through Bosasso port followed by Mogadishu port. However, traders mentioned that the floods have damaged and destroyed hundreds of bags of locally produced and commercial food commodities (SC-UK D , 2012).

Environmental effect: the polluting of sources of pure water, such as natural springs and cylinder wells, bank disintegration, silting of river beds and subsequent parallel moving of river channels, dislodging of creatures and chopping down of trees for kindling around help camps are a portion of the unfavorable environmental effects of floods in the Juba and Shabelle Basin(UNDP, 2012). Cholera, the runs and typhoid fever illness and now and then, deaths are essentially brought about by an absence of unadulterated drinking water, ill-advised capacity and treatment of drinking water, helpless cleanliness rehearses and the crumbling of sewage and sterilization offices which lead to the tainting of savoring water flood influenced territories (Tulchinsky, 2018). There is a break in water flexibly and tainting prompting medical problems. Squander assortment and disinfection offices can get overpowered prompting pollution and

sullyng of drinking water supplies. The waste water blending in with the flood water is a significant reason for environmental pollution (Kimei, 2013).

Financial impact: Since Somalia does not have legal financial frameworks for the last 20 years, it may not be easy to estimate the financial impact from the flooding of Shabelle river. The Somali interagency response groups, however, estimate the cost of offering relief food and accommodation to the people displaced by floods (Fatma, 2006). In Beledweyne Markets continue to function normally and are fairly integrated with other regions of Somalia. Commodity Supply routes and the flow of trade goods into and out of Beledweyne town remains the same as before the floods. Most of the commercial import goods including food stuffs come to Beledweyne through Bosaso port followed by Mogadishu port. However, traders mentioned that the floods have damaged and destroyed hundreds of bags of locally produced and commercial food commodities (Ambuchi, 2011).

Water, Sanitation and Hygiene in 2016, admittance to improved water flexibly in Somalia was assessed at 32%, while populaces with improved disinfection were assessed at an amazing 24%, one of the least %ages on the planet. Repeating dry spells, presently a typical regular element of Somalia, joined with inward dislodging and a crumbled organization of water focuses to compound helpless access; constraining flexibly needs frequently to be met through crisis activities, for example, water shipping. Absence of admittance to perfect and safe water has exacerbated frequencies of water-borne infections particularly cholera which is endemic in Somalia (Ayele, 2018)

During the benchmark time of 2013–2015, SWALIM assessed that there were around 3,733 water focuses, 61% (2,261 wellsprings) of which were accounted for to be perpetual, under ordinary conditions. Higher extents of berkads and dams gracefully water for just aspect of the year contrasted with different sources. An evaluation done by SWALIM on vital bore-holes among February and April 2017 on chose districts in the south and focal pieces of the nation recognized that lone 79% of the perpetual/key boreholes were useful (Gure, 2018).

By the second week of December 2019, rains across Somalia as well as adjacent eastern Ethiopian high- lands had started to subside in intensity. However, cyclone Pawan made landfall in early December 2019, causing damage to fishing boats, road infrastructure, homes and

livestock in coastal parts of Bari, Nugaal and Sanaag regions. In some parts that received much rainfall during October and November, massive floods led to the displacement of people, agricultural land damage, and road network dispartages were witnessed in several areas of Somalia. Lower Juba, Middle Juba, Gedo, and the Bay regions were the most affected as a result of the flooding. More than 400, 000 people were displaced by the floods, especially in Jammame and Hiiraan areas of Somalia (Abdullahi, 2017).

2.5 Coping strategies

Adapting is the way where people act inside the constraints of existing assets and scope of desires to accomplish different closures. As a rule this includes close to 'overseeing assets', however for the most part it implies how it is done in surprising, unusual and unfriendly circumstance. Consequently adapting can incorporate guard systems, dynamic methods of tackling issues and techniques for dealing with pressure (Thapa, 2005). When a stuns hits, family adapt by changing work design moving more individuals in to the work power, or working more hours or by lessening use, taking credits, renting resources, or in the outrageous they sell resources. Individuals from family units may move to the town, or families may move together. On the off chance that this additionally doesn't work, at that point individuals will be or request help (Adelekan, 2014).

Family units with great monetary status purchased a land or house in more secure spot so they can live there in season of emergency. As self-insurance is additionally one of the procedures embraced by the moderate family unit. The other part of security – social assurance is the capacity of non-financial social relations as, shared guide in a community, neighborhood, or broadened family. Other than this arrangement of measures of prevention by the government and other foundation who gracefully and uphold the casualties at the hour of emergency (NTI, 2008).

Contingent upon the enrichments, qualifications and different variables adapting procedures will fluctuate by area to locale, from one community to another, social classes, family, age, sexual orientation and season. People who live in the mountains face hazards consistently, as they have created numerous methods of adapting, yet they are weak in any case, and many adapt to the extent that this would be possible, and are then compelled to desert their homes (Dahal, 1998).

The adapting procedures announced from different pieces of semi-bone-dry provincial India don't vary fundamentally: these incorporate developing blend yields and raising an assortment of animals, winning the work and tenure market varying, drawing down put away products or fixed resources altering utilization, getting and drawing upon conventional security: what contrasts from district to hand over occasions in the example who embrace which systems, in what grouping and under what conditions (Chen, 1991). Family unit embraced an assortment of ways of dealing with stress and methodologies. At the point when flood happens, needs will in general separate as follows: most importantly the casualty attempt to spare themselves and will attempt to spare significant products. Besides, they attempt to spare their food storages thirdly they endeavor to spare their creatures and feed for them, in the hour of serious flooding family's delivery their domesticated animals' and they attempt to shift them to loftier raised parts, "what amount can be spare is seen on their 'karma' just as on the sort and length of flood" when flooding cause yields to fall flat, families must search for other work so as to continue themselves until the following yield is gathered, if that isn't harmed. (Ambuchi, 2011)

After the floods people can't contract their property to get cash since it has little worth and simultaneously no one needs to purchase the influenced land. Consequently, the motivations to put further in cultivating decreases strongly, families for the most part have two alternatives to reestablish pay sources following significant floods misfortunes. In the event that they approach water system and can rely on growing winter crops, they get food reserves from their neighbors to address their issues for a couple of months until the harvestings time. In the event that they need admittance to water system the vast majority endeavors to secure positions inside the town, or at a reasonable driving separation. In the hour of emergency it has likewise been noticed that a large portion of the casualties work in the help actives which are one of the ways of dealing with stress. On the off chance that the above said occupations are not accessible locally they relocate to close by town and urban communities. For the individuals who can't move to different places or secure positions, selling area and gold trimmings and asking is the final retreat (World Bank, 2006).

Emergency occasions happen now and again in people lives, just as in the lives of entire networks and social orders, where case they are frequently called disaster. Such occasions require the activation of assets at different levels to adapt to their effect. At the point when

people realize an event may occur later on the fact that it has occurred before, they frequently set up methods of adapting to it (Chen, et al., 2015).

Helpless family units frequently adapt by decreasing utilization, eliminating kids from school and looking for off-ranch business (at low wages). A few investigations infer that a suitable approach is expected to help weak family unit in this "broadening process". In any case, backing of adapting conduct can keep family unit secured in the horrendous patterns of neediness. Concern exists that destitute people have less capacity to smooth utilization and this failure may prompt conduct, for example, moving to safer portfolios that compounds salary disparity (Ang'awa, et al., 2007).

Somalia doesn't fit into any of the traditional classifications of IDP circumstances as the nation doesn't have a solitary dislodging design with a basic circumstances and logical results condition. Over 27 years of inward clash, joined with dry season, flood and testing occupations in Somalia has brought about a blended circumstance of removal and relocation running from intentional to constrained movement designs. People have been dislodged and relocate for different reasons. Some influenced people have been dislodged for just brief timeframes like floods, while others have been uprooted since the mid 90s. Frequently removal is anyplace along the continuum between constrained uprooting to deliberate financial relocation looking for new jobs with a blend of components making people move (World Bank, 2014).

Variables are exacerbated in metropolitan ghettos. Expanded conversation about metropolitan environments features both the duplicated impact of cataclysmic events on metropolitan poor and dislodged populaces, just as the improve in probability of such disasters as the impoverishment of ghetto inhabitants and uprooted people forces them to live in hazard-inclined areas, for example, low-lying zones and landfill destinations or in unsatisfactory, swarmed and insanitary lodging. Complex examples of development are integral to the adapting procedures of the uprooted. Somalis have utilized various procedures to oversee and limit interruptions in their lives, including: relocation inside or between regions focuses, moving between town edges and country regions, the partition of relatives to amplify the advantages accessible at various areas, and by more critical development to inaccessible areas, including to neighboring nations and further abroad. These perplexing social choices additionally reach out to the elements of return; in some cases guys select to re-visitation of their regions of cause and ladies and kids are

abandoned with the aim to move back if and when the circumstance improves and they are better ready to settle. The habitations of the people in Baledweyne Preparing before flood coming to diminish the hazards of the River flooding (Abdullahi, 2017).

2.6 Theoretical framework

The theoretical framework utilized in this investigation depends on anticipated utility models and has been adjusted by Tobin and Newton (1986), who presented a definite depiction of the premises and establishment of the applied base. Basically, the framework specifies that the connection between the flood risk and private property value can be inspected regarding the utility got from a land package, which strays from anticipated utility because of flood seriousness or potentially recurrence. The theory holds that flood occurrences will make harm structures on the floodplain, thereby decreasing utility of the land.

Disaster impact model theory developed by Lindell and Prater (2003)

The theory of flood disaster effects on smallholder farmer's food security was developed based on Lindell & Prater (2003) disaster impact model, which was later modified by Israel and Briones (2013). In summary, the model depicts that hazard agent characteristics (disaster characteristics) triggers physical impact on an economic activity which consequently results in social impact at the household level in terms of its negative effect on food security and income. The physical impact is expected to be reduced by mitigation strategies and emergency and preparedness practices while social impact can be alleviated by recovery resources, other extra assistance, and socio-demographic and economic factors.

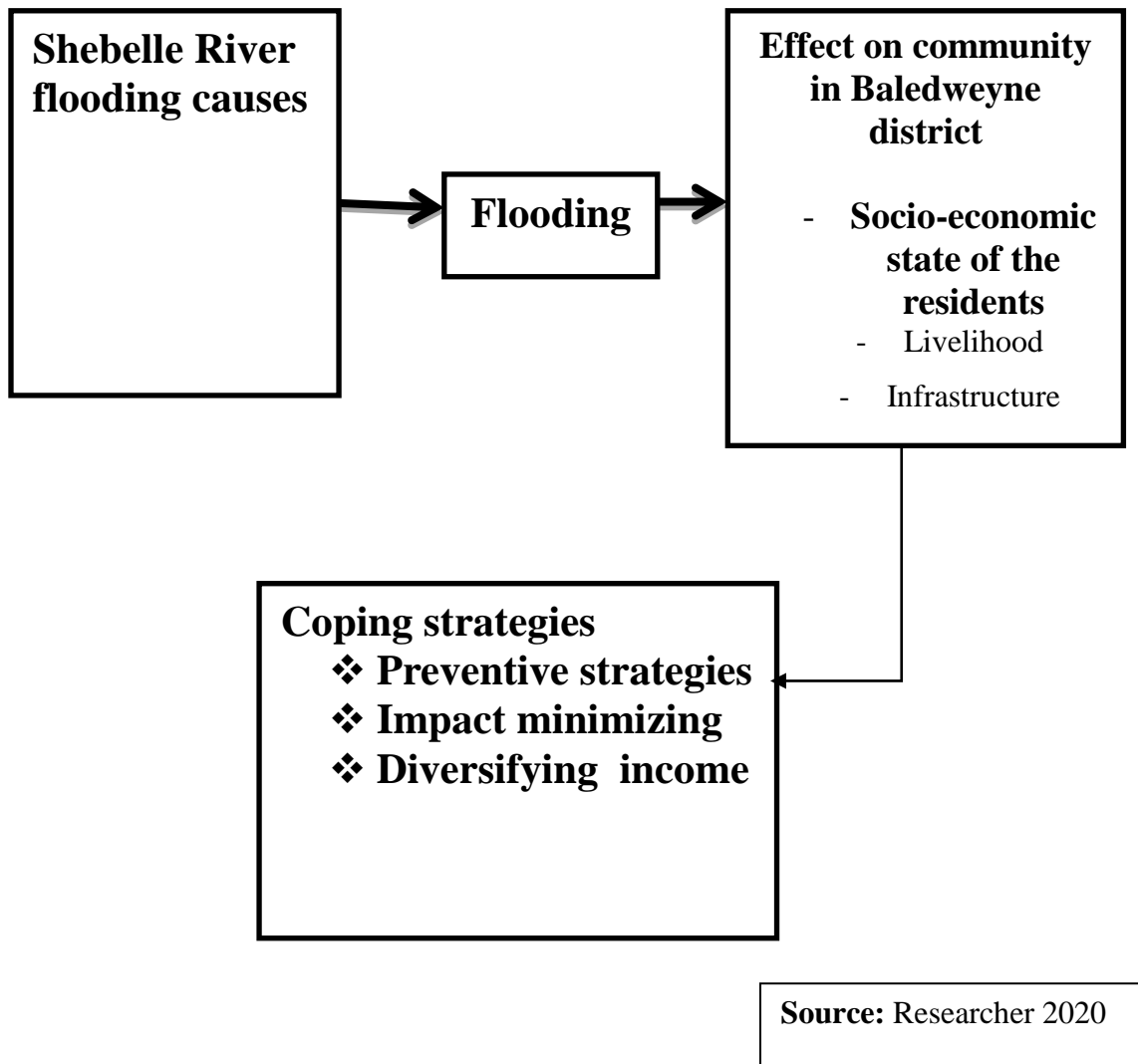
Robust theory of development developed by Crocker (1991)

The study was based on the robust theory of development developed by Crocker (1991) and has prescriptive, descriptive, interpretive, explanatory, and predictive tasks to perform and each of these possesses strong valuation dimensions. The theory emphasizes human concern including flood impacts and it also highlights the importance of social and economic variables. Normative theories help to make legible the many and varied accounts of the values and norms involved in development, how these vary across contexts, and how they are impacted by (and in turn impact) local and global phenomena (Dower, 1998). These normative theories aspire to describe a

"desirable harmony and integration of several different areas of human concern," including identifying which of these have an overriding claim on our attention and resources (Premasiri, 1996). Grounding ethical criteria in an underlying theory of justice, rather than allowing them to exist merely as a scattered set of ad-hoc principles, not only provides coherent moral justification for action, but also reveals any dissonance between professed intent, embedded virtue, and concrete outcome (Grey, 2008). I used the Disaster impact model theory because it was most relevant to my study.

2.7 Conceptual framework

Figure 2.1 Conceptual Framework: Perception study of community of Baledweyne District to the impacts of Shabelle River floods



2.8 Research gap

Most studies have studied the perennial flooding of River Shebelle but few have sufficiently addressed the root problem- what exactly contributes to the massive flooding. It is therefore, justifiable for this study to consider the essential factors associated with the flooding of River Shebelle. In the literature (Swalim, 2009) there are many factors causes of Shebelle river flood occurs in Baledweyne district such as dumping solid wastes in the river at dry season. Soil erosion, Shape of the river when flows in the district. The result of putting in rubbish things in the river decreases the capacity of river. But there is an other factors that causes flood in Baledweyne that is not mentioned in the researcher such as heavy water come from Ethiopian highlands, deforestation is another factor that cause of flood in Baledweyne district and urbanization is an other factors because the people destroy river bank and the river decrease the capacity of water.

According to (Mohammed, 2000) Loads impact directly and indirectly on the social activities as whole but did not detect particular effect for instance floods arise the transmission of communication disease that can reduce the health and the effectiveness whole of the society particularly labor and cohesion workers. Disruption of schools, colleges and university also is another consequence of floods. Shortage for labor supply is other causalities of the floods hence the labor immigration rise at high rate.

CHAPTER THREE

STUDY METHODOLOGY

3.1 Introduction

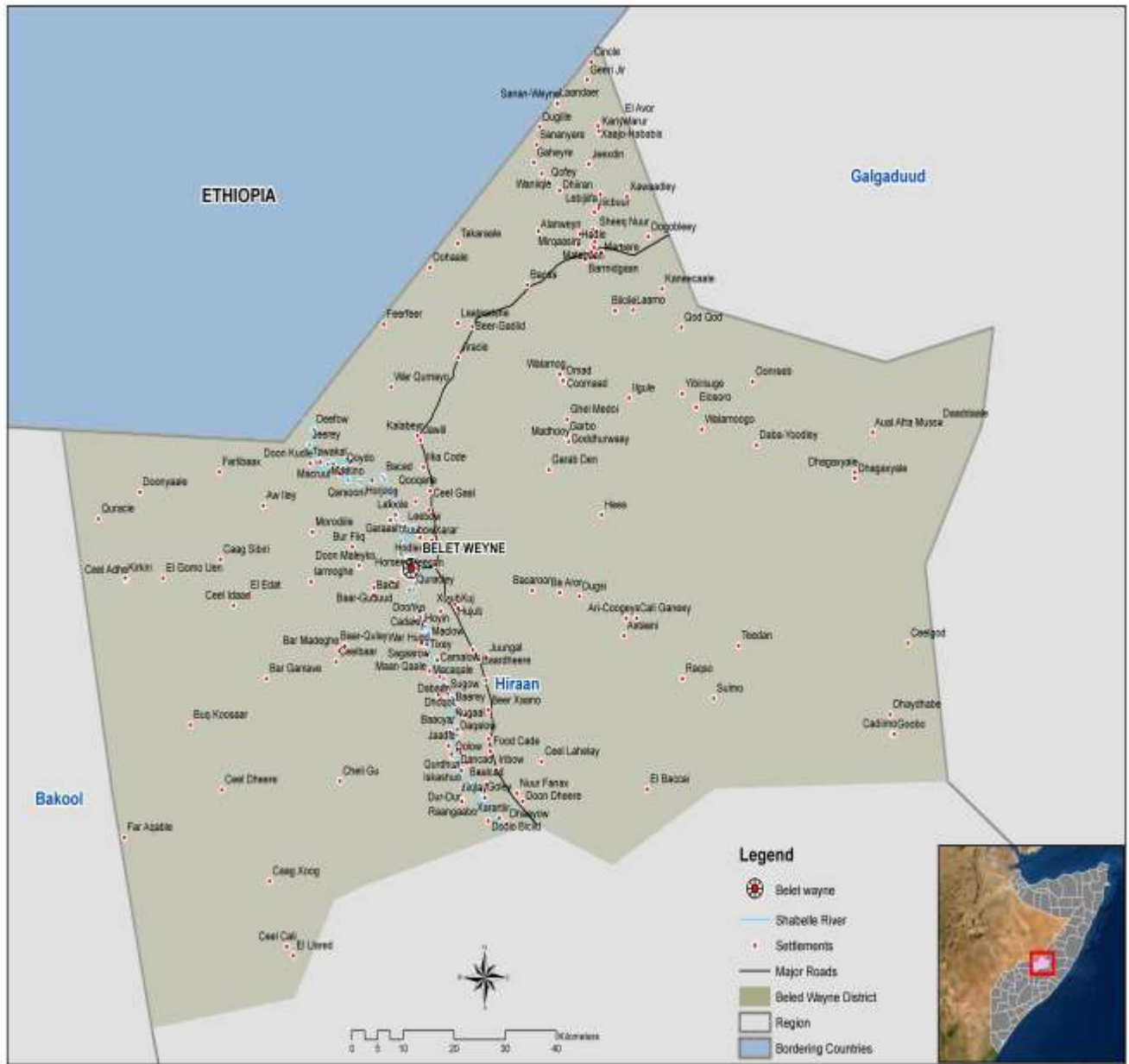
This chapter entails the study area, design of the research, the sampling techniques and research techniques, instruments to test reliability and validity, analysis of data and ethical aspects of the study.

3.2 Study area

The study took place in Somalia. Somalia is situated at north eastern part of the horn of Africa and circumscribed by Ethiopia toward the west, Djibouti toward the north, the Gulf of Aden toward the northern part of the Indian Ocean toward the eastern part and Kenya toward the Southern part. Somalia's absolute land territory is a total of 637,600 km², of which 45% is named rangelands appropriate for animals touching, 30% is delegated desert land, which composes 14% is secured by timberland and 11% is productive land. The Juba and Shebelle River bowls are global river bowls at the Horn of Africa depleted through Somalia, Kenya, and Ethiopia and the main lasting rivers moving through Somalia (Sebhat, 2014).

The study focused on Beledweyne, Hirshabelle State. Baledweyne is situated in the Shabelle Valley near the Ethiopian border some 330 km north of Mogadishu. The town is an industrial productive zone and is a vibrant commercial hub supplying livestock and agricultural products to local and international markets through the Berbera and Bossaso seaports. Beledweyne also has a large livestock market that brings together livestock traders from all over the country. Beledweyne is divided by the Shabelle River into eastern and western sections as depicted in Figure 3.1 below. The Shebelle River rises on the eastern part of the Ethiopian highlands at an elevation of around 4,230 m.a.m.s.l (Meters above Mean Sea Level). The river is composed of two principle feeders in the Ethiopian catchment area: the Shebelle and the Fanfan. The progressions of the Fanfan feeder are discontinuous and join the Shabelle River only during high precipitation seasons. The length of the river is 2,526 Km, with a catchment zone of 283,054 Km². The normal progression of the Shebelle River at Baledweyne Station is 75 cubic meters (75,000 liters) every second (Gadain, David & Mburu, 2016).

Figure 3. 1: Study map showing the area of study



Source: Researcher 2020

3.3 Study Design

During the study, a survey design was used. Descriptive research entails the profiling of persons, situations, and occurrences. The reason of carrying out the descriptive survey was to measure, define and document the various areas of events as they occur (Polit, 1995). Descriptive gives

the researcher the opportunity to collect information, summarize and present it for confirmation (Orodho, 2002).

3.4 Target population

Target population was 55,410 living in Baledweyne. Baledweyne district has a total population of 55,410 people (world population review 2020). Baledweyne consists of four villages: Koshin, Holwadaag, Hawataago, and October. This study mainly focused on the impacts of the Shebelle river flood on the community in Baledweyne. Therefore, the researcher purposively selected, District Disaster Management Committee, Community Leaders and Displaced People (IDPs) in Baledweyne, Hirshabelle state, Somalia because they are the most affected from the flooding.

3.5 Sample Size and Sampling Procedures

The researcher used (Yamane 1967) the Slovene’s formula of sampling to determine the size of the sample size and to assess if it is reasonable enough. Due to limited time and resources, a sample size of 397 people was selected from the study with a population of 55,410. The key respondents of households comprised district Disaster Management Committee (Education, Water Affairs, Community Development and agriculture), Community Leaders and Displaced People (IDPs). The formula used as indicated

$$n = \frac{N}{1 + N(e^2)} = \frac{55,410}{1 + 55,410(0.0025)} = 397.1331302634 \approx 397 \dots\dots\dots\text{Eqn 1}$$

Where:

n = Size of the sample

N = size of the population

e = significance level, estimated at 0.05

The sample size of this study was determined using the census sampling method. The target population was 55,410, with a “margin of error” of 5 % and a “confidence level” of 95 %, giving a sample size of 397. The total sample size was distributed between the four villages of Beledweyne namely; Kooshin, Hawataako, Howlwadaag and Bundoweyne. The underlining assumption is that how floods affected these villages is totally different, so according to the

magnitude of the flood, effect to the villages is based on proportion size of the number of the households interviewed. So the following is how the distributions of interviewed household was managed between villages; Hawo taako being the most flood effected village in Beledweyne town which was allocated 38%of household to be interviewed out of 397 households equivalent to 150 households, while Kooshin is the second village in terms of the flood impact with 25%allocated corresponding to 100 household while Hawlwadaag was 21%accounting for 85 households and finally Bundoweyne was assigned 16%equivalent to 62 households. As per this distribution of the survey sample, the total households sampled are 397 households and all of these households were interviewed. The sample size was distributed in the following categories as Disaster Management Committee (Education, Water Affairs, Community Development and agriculture) sampled 96, Displaced People (IDPs) sampled 273 and Community Leaders sampled 28.

Table 3. 1 Simple size

Name of villages	Category of respondents	Sample sizes	Total of sample sizes	%
Hawatako	DDM committee*	40	150	38
	Community leader	10		
	IDPS*	100		
Koshin	DDM committee*	25	100	25
	Community leader	7		
	IDPS	68		
Holwadag	DDM committee*	15	85	21
	Community leader	5		
	IDPS	65		
Bundaweyn	DDM committee*	16	62	16
	Community leader	6		
	IDPS	40		
	Total	397	397	100

* **DDM** committee District Disaster Management

***IDPS** Internally displaced people

Source: Field data (2020)

This study adopted a descriptive research design approach and involved the collection of both quantitative and qualitative data. Quantitative data was collected through a desk review of previous assessments, reports and documents to quantify the extent of floods impact. Qualitative data sources were used as the primary source of data collection in this study that includes Feedback from the floods affected population (households), Key Informant Interviews (KIIs), Focus Group Discussions (FGDs).

The descriptive research design was selected because it provides the opportunity to determine the target from the population that will give the most accurate information. This sampling method allows the researcher to use his/her own judgment to determine the population members that are more likely to give the most precise information as required in the research (Dahir, 2016).

3.6 Data Collection Instrument

This study used both qualitative and quantitative approaches to collect data. The data was collected by using questionnaire.

3.6.1 Questionnaire

It is a procedure of gathering information that is generally utilized in research scholastic, and in which the analyst gives a rundown of short questions to the respondents mentioning them to fill and gather them later. In the questionnaire, shut finished questions are intended to suit the destinations so as to successfully get information for the investigation. The questionnaire is organized in a four (4) point Likert Scale design. An exceptionally organized inquiry design was took into account the utilization of shut questions that require the respondent to browse a foreordained arrangement of reactions or scale focuses (4 strongly agree 3 agree 2 disagree and 1 strongly disagree). The affirmed questionnaires were conveyed to the respondents in the chose habitations in Baledweyne.

3.7 Validity and Reliability of Research Instrument

3.7.1 Validity

The validity and reliability for the census sampling method was determined by the formula below.

Content Validity Index (CVI)

Content Validity Index (CVI)

CVI = Number of questions announced legitimate

Complete no. of questions in the questionnaire... .. Eqn 2

On the off chance that the general Content Validity Index (CVI) of the instrument is equivalent to the normal adequate Index of 0.70 or above, at that point the instrument will be acknowledged as legitimate.

3.7.2 Reliability

Reliability shows the dependability and consistency with which the information assortment instrument gauges the idea (Zikmund, 2000). For this study, investigation, the unwavering quality of the exploration instrument was improved using the split-half dependability system where the scientist oversees the whole instrument to an example of respondents during the pilot testing and will figure utilizing the all-out score for each arbitrarily separated half and the inclusion of some examination master. To guarantee the dependability of the reactions that were acquired from the examination, Cronbach's alpha was utilized. On the off chance that the figure for Cronbach's Alpha is above 0.7, the instrument is to be announced as dependable. This test affirmed that the instrument has abundant inward consistency.

3.8 Data collection procedures

Data collection procedures are the modalities of carrying out data collection. Data of the study was obtained by visiting sampled respondents from different villages and schedule a meeting in which the questionnaires' were distributed. The interviews were conducted on the agreed dates and the proceedings were recorded. The questionnaires were distributed to the sampled households with the aid of a research assistant, and the completed questionnaires were collected later on agreed date. This was helpful in increasing the questionnaire return rate and in reducing the chances of delay. Instructions were carefully explained to the respondents during the issuing of the questionnaires and they also assured that the information given would be treated confidentially and used only for the purpose of the study. The completed questionnaires were checked for completeness and appropriateness of the responses.

3.9 Data analysis techniques

Data analysis techniques are the processes of inspecting, cleansing, translating, and modeling data to discover useful information, suggest conclusions to support the decision-making process (Orodho,2003). Data collected during the study were analyzed using the descriptive data analysis techniques and literary analysis. The items in questionnaires were identified and assigned a variable name and also assign values (coding process). Descriptive statistics were used to measure frequency. The responses were used to compute descriptive analyses which were presented using Tables and statistics, and the results were used to form important inferences from which the conclusions were drawn. The Likert scale that will be used is shown below.

Mean range	Response range	Interpretation
3.26 - 4.00	strongly agree	Very high
2.51 - 3.25	agree	high
1.76 - 2.50	disagree	low
1.00 - 1.75	strongly disagree	Very low

To analyze the causes of river flooding, the questionnaires were used whereby they were equally distributed to all the respondents, after which their results were analyzed. To understand the impact of the flooding on the socio economic activities of the communities in Balywedyne district, both interviews and questionnaires were used.

3.10 Ethical consideration

This study considered closely adhered to the ethical considerations. All the privacy, anonymity, and confidentiality aspects were considered. Furthermore, the researcher also maintained a high level of self-confidence.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The chapter studied the effects of flooding on the communities living in Baledweyne district. The section highlights the data collection, presentation and analysis to establish the reasons for the river flooding, the socio economic effects that the flooding has on the community development and the coping mechanisms practiced by the local people around Baledweyne district during floods. The information investigation and Interpretation depended on the examination questions just as exploration goals, the introduction was partitioned in two sections. The initial segment presents the respondents profile or demographic data, while the subsequent part manages introduction, understanding and examination of the exploration goals.

4.2 Demographic information of the respondents

This segment presents the foundation data of respondent who took an interest in the examination. The motivation behind this foundation data is to discover the attributes of respondents and shows the circulation of the populace in the examination.

4.1.1 Sex determination respondents

The results are given in table 4.1

Table 4. 1: Sex determination

Sex	Frequency	%age
Male	208	52.4
Female	189	47.6
Total	397	100

Source: Primary data, (2020)

The study found out that the majority of the respondents were male with 52.4% while 47.6% were female which shows that there was not much disparity in data collection, both Sexes opinion was all represented fairly. This emphasizes that the male contributed more than the female in the study.

4.2.1 Age of Respondents

Table 4.2 shows the age of the respondents.

Table 4. 2: Age respondents

Age	Frequency	%age
18-28	170	42.8
29-40	146	36.8
40 and above	81	20.4
Total	397	100

Source: Field data, 2020

The findings show that most (42.8%) of the respondents responded that they were between the ages of 18-28 years while 36.8% were between 29-40 years while only 20.4% were above 40 years old. This shows that those who dominated and have benefited from District Disaster Management Committee are members between 18-28 years followed by 29-40 years. They had experience and understood the causes and impact of Shebelle River flooding.

4.2.2 Marital status respondents

Table 4.3 shows the marital status respondents

Table 4. 3: Martial status respondents

Marital status	Frequency	%
Single	215	54.2
Married	182	45.8
Total	397	100

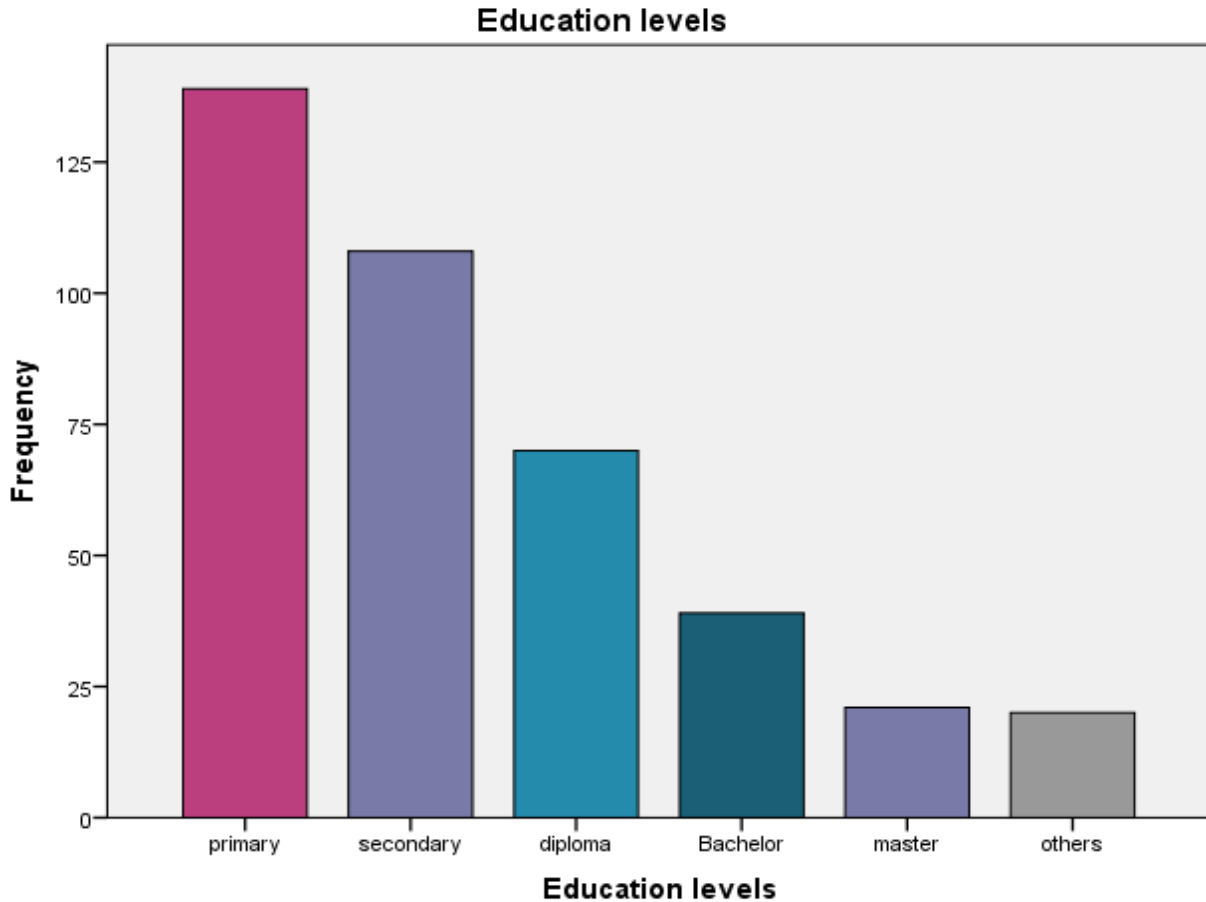
Source: Field data, 2020

Table 4.3 of marital status shows the average of 215 respondents are single with the %age of 54.2% and frequency of 182 respondents were married with the %age rate of 45.8%. The respondents for the study were mostly married and it implies the spouses are vulnerable to the flood problems. Families are more likely to feel the impact of river flooding by nature of their responsibility in the society.

4.2.3 Level of Education of the Respondents

The level of education is shown in figure 4.1

Figure 4. 1 Level of Education of the respondents



Source: Field data, 2020`

Figure 4.1 shows average of 139 respondents with %age of 35% are secondary respondents, 27.2% respondents had diplomas with the average of 108, the frequencies of bachelor were 70 respondents with the %age 17.6 %, 9.8 % respondents of this study were primary school certificate holders with frequencies of 39, 5.3% respondents had master's degree with average of 21 respondents and average of 20 respondents with %age was 5%. The majority of the study respondents were secondary school holders. Therefore, it can be noted that majority of the respondents had attained the basic education and thus would provide valid and consistent

Information. However, the respondents may not have concrete knowledge on floods and how the floods impact their livelihood.

4.3 Major Causes of Shebelle River Floods in Baledweyne

The first objective for this project was to investigate major causes of Shebelle river floods. The questions of the objectives were four and were based on four likert scales, Strongly Agree, Agree, Disagree, and Strongly Disagree. The respondents agreed that Heavy rains that come from high land of Ethiopia cause flood, lack of control structures of river banks, improper use of river irrigation induced flood, and deforestation might bring floods

Table 4.5 Major causes of Shebelle River

Questions	Responses	Frequency	Percentage %
Heavy rains come from the highlands of Ethiopia.	Strongly disagree	41	10.3
	Disagree	70	17.6
	Agree	100	25.2
	Strongly agree	186	46.9
Total		397	100
Lack of control structures of river banks and poor drainage system causes floods	Strongly disagree	37	9.3
	Disagree	75	18.9
	Agree	81	20.4
	Strongly agree	204	51.4
Total		397	100
Deforestation may bring floods	Response range	49	12.3
	Strongly disagree	57	14.4
	Disagree	145	36.5
	Agree	146	36.8
Total		397	100
Improper use of river irrigation induces floods	Strongly disagree	56	14.1
	Disagree	103	25.9
	Agree	125	31.5
	Strongly agree	113	28.5
Total		397	100

Mean range	Response range	Interpretation
3.26 - 4.00	strongly agree	Very high
2.51 - 3.25	agree	high
1.76 - 2.50	disagree	low
1.00 - 1.75	strongly disagree	Very low

Source: Field data, 2020

The study found that the primary cause of River Shebelle flooding was the heavy rains that come from the Ethiopian Highlands with 72% of the respondents agreed (strongly agree and agree) that the Ethiopian highlands were topmost in contributing to the flooding of river Shabelle, while 28 % of the respondents disagreed (strongly disagree and disagree). Another reason that led to the flooding of river Shabelle was the lack of control structures at the river banks. 72% agreed (strongly agree and agree) that River Shebelle lacks flood control mechanisms at the river banks, which contributes to the frequent flooding of the river, while 28% disagreed (strongly disagree and disagree). The third factor that leads to the flooding of river Shabelle was the identified prevalent deforestation with 73.3% of the respondents agreed (strongly agree and agree), while 27% never agreed (strongly disagree and disagree) Lastly, improper usage of river irrigation causes the flooding of river Shabelle. To this factor, 60 % of the respondents agreed (strongly agree and agree) while 40 % disagreed (strongly disagree and disagree).

The more significant part of the catchment area of river Shabelle is in the upper parts of Ethiopia, whose waters mostly contribute to the inflows of the river at Shabelle and the Juba Rivers. The high rainfall in the upper catchment areas is the most significant reason why the river floods. Furthermore, the weak river regulation structures or none existence around the banks of the river also contribute to the flooding of the river. Furthermore, the declining forestry around Shabelle means that there is less natural vegetation to contain the floods, and the water finds a free course around its banks.

This implies that for a long time, the management of River Shabelle has been compounded with multiple challenges. First, river Shabelle flooding has inundated scarcity of cultivated land frequently along the course of the river. In addition, the continuous deterioration of the mechanisms for river regulation and flood-control, compounded with the unauthorized settlements along the flood plains of the river, have further increased the vulnerability of the communities inhabiting the river borderline to the flooding of the river. The settlements around the river and the additional encroachment of the river embankments in search of more water for flood irrigations have further made the flood plains more vulnerable to frequent flooding.

Further, the deposits of the sediments in the river bed have raised the river's bed level with time, leading to the breaching of the river's courses around Shabelle River.

4.4 Flood effects on community

The study's second objective was to evaluate the Impact of flood on social-economic livelihood. The questions of the objectives were four and were based on four likert scales, Agree Strongly, Agree, Disagree, and Disagree Strongly. The respondents agreed that River Flooding causes Loss of lives, damage infrastructures, increase mass migration and decreases farm productivity.

Table 4. 4 Impact of Shabelle River flood on social economic livelihood

Questions	Response	Frequency	Percentage (%)
River Flooding causes Loss of lives	Disagree Strongly	42	10.6
	Disagree	30	7.6
	Agree	79	19.9
	Agree Strongly	246	62.0
Total		397	100
Floods damage infrastructures	Strongly disagree	42	10.6
	Disagree	83	20.9
	Agree	118	29.7
	Strongly agree	154	38.8
Total		397	100.0
River Flooding increase mass migration or population displacement	Strongly disagree	55	13.9
	Disagree	78	19.6
	Agree	99	24.9
	Strongly agree	165	41.6
Total		397	100
Flood decreases farm productivity	Strongly disagree	39	9.8
	Disagree	69	17.4
	Agree	108	27.2
	Strongly agree	181	45.6
Total		397	100
Mean range	Response range	Interpretation	
3.26 - 4.00	Agree Strongly	Very high	
2.51 - 3.25	agree	high	
1.76 - 2.50	Disagree	low	
1.00 - 1.75	Disagree Strongly	Very low	

Source: Field data, 2020

The findings of the study show that 18 % of the respondents disagreed with the question that river Shabelle flooding causes loss of lives, while 82 % were positive. On the other hand, 68 % of the respondents agreed that flooding leads to damage to infrastructure, while 31 % disagreed.

Thirdly the respondents agreed that river flooding leads to massive population migration and displacement for the inhabitants around the river Shabelle. With most of the respondents (66 %) agreed, while 33 % disagreed. Lastly, 73 % agreed that flooding increases farm productivity, while 27 % of the respondents indicated a negative response.

The evaluation of the Impact of River flooding on social-economic livelihoods agreed. Most of the respondents indicated that the flooding of River Shabelle affects social-economic livelihoods of the communities around the river. The results of this study confirm recent reports from the United Nations that indicated 370,000 had been displaced due to the flooding of river Shabelle (DanChurchAid & Alliance, 2020). At the same time, FEWSNET indicates that more than 10 % of the crops below river Shabelle have been swept away by the floods. Most of the cropping activities have been hampered in the lower region of the river (FEWSNET-Seasonal Monitor, 08 November 2019). However, the lower part of the river is deposited with fertile soils that encourage the growing of cash crops for the locals. The present study and results have confirmed the same as indicated in table above.

4.5 The coping mechanisms practiced by the local people.

The third objective of the study was to evaluate coping strategies formulated by the local members to flood hazards and exploring alternatives. The questions of the objective were four and were based on four liker scales, Agree Strongly, Agree, Disagree, and Disagree Strongly. The respondents agreed to make Preparation before the onset of flood to decrease the hazards of the River flooding. Poor households often try to adjust by reducing their expenses, withdrawing children from school and seeking off new ways of sustaining themselves. All the victims try to salvage what they can, and those who are financially stable enough to acquire land elsewhere do so.

Table 4.7 Coping Mechanisms Practiced

Questions	Responses	Frequency	Percentage (%)
There is no preparation for the flood to reduce losses	Strongly disagree	43	10.8
	Disagree	51	12.8
	Agree	61	15.4
	Strongly agree	242	61.0
Total		397	100
Poor households usually cope by reducing expenses, withdrawing children from school and looking for new ways of sustaining themselves	Strongly disagree	56	14.1
	Disagree	97	24.4
	Agree	117	29.5
	Strongly agree	127	32.0
Total		397	100
The victims try to salvage what they can	Strongly disagree	76	19.1
	Disagree	89	22.4
	Agree	125	31.5
	Strongly agree	107	27.0
Total		397	100
Households that are financially stable can acquire land somewhere else	Strongly disagree	192	48.4
	Disagree	64	16.1
	Agree	66	16.6
	Strongly agree	75	18.9
Total		397	100

Mean range	Response range	Interpretation
3.26 - 4.00	agree Strongly	Very high
2.51 - 3.25	agree	high
1.76 - 2.50	Disagree	low
1.00 - 1.75	Disagree Strongly	Very low

Source: Field data, 2020

The evaluation of the coping mechanisms practiced by the local people is low. 76 % of respondents indicated that the residents are always not well-prepared before the flood to cope with hazards that come with the flooding of the river. On the other hand, 23 % of the respondents agreed that the residents around river Shabelle were always prepared to meet the floods. 61% of the respondents indicated that poor households often cope with the threat of the floods by shifting from the river banks and moving to places of higher altitude with hazards posed by the flooding of river Shabelle. However, 38 % of the respondents indicated that there was no possible preparedness from the residents towards the poor households around the river banks. On the question of whether victims tried to save themselves from and their belongings from the raging floods, 58 % of the respondents indicated that victims around the river Shabelle always try to move from along the river banks to keep safe during floods. However, only 41 % of the individuals expressed a feeling that most of the residents were not well-prepared for the floods by saving themselves or by shifting their belongings.

The lastly, most of the respondents indicated that residents were not economically stable enough to acquire land or houses because they were not economically stable. While cases of flooding have been reported around the Juba River, more significant effects have been reported around river Shabelle compared to other areas. Most of the communities around the environs of Juba River are poor- they cannot, therefore, manage to make pre-arrangements to shield the effects of flooding before the actual flooding season begins. However, to cope with the flooding, most families react by shifting to other areas that are considerably safer and withdrawing their children from school.

Most of the children are driven to fend for themselves by seeking new employment. This is mainly because low-income families have less to depend on during the flood season and may not, therefore, be able to provide for their families adequately. However, most of the families around the river make some effort to save themselves from the effects of the flood by either moving to safer places completely or relocating their belongings. Amongst these people, there are some of the economically stable communities that do not make any efforts to seek for alternative lands or acquire new houses because they are reluctant to move from a place that they have been used to, and a place that is most probably fertile, and therefore, more preferable to them to any other place.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter entails the highlight of summary, conclusions, and recommendations. All these are made based on the findings from the research.

5.2 Summary

The study found out that the most of the respondents were males, with a percentage of 52.4%, while 47.6% were female. The findings showed that age majority of respondents' were between the ages of 18-28, standing at 42.8%. An average of 215 of the respondents were single, representing a percentage of 54.2%. Most of these respondents had primary school level of education. The key findings for this study include:

The first objective for this project was to study into the causes of River flooding in Baledweyne district. The study found out that the major contributing factor to the flooding of river Shabelle was the massive water that accumulated from atop the Ethiopian highlands, the more significant part of the catchment area of river Shebelle in the upper parts of Ethiopia. The high rainfall in the upper catchment areas is the most significant reason why the river floods. The weak river regulation structures around the banks of the river also contribute to the flooding of the river. Furthermore, the declining forestry around Shabelle means that there is less natural vegetation to contain the floods, and the water finds a free course around its banks. The settlements around the river and the additional encroachment of the river embankments in search of more water for flood irrigations have further made the flood plains more vulnerable to frequent flooding. Further, the deposits of the sediments in the river bed have raised the river's bed level with time, leading to the breaching of the river's courses around Shabelle River.

The second objective of the study was to understand how was river floods affect the socio-economic state of the residents. The evaluation of the Impact of River flooding on social-economic livelihoods agreed. Most of the respondents indicated that the flooding of River Shabelle affects social-economic livelihoods of the communities around the river. The respondents indicated that the flooding of river Shabelle causes loss of lives, damage of

infrastructure, increase of mass migration and a decrease in farm productivity. Generally, the findings indicated that river Shabelle flooding has a negative impact on the residents.

The third objective of the study was to investigate the coping mechanisms practiced by the local people around Baledweyne district during floods. The respondents agreed there is no preparation before the onset of flood to decrease the hazards of the River flooding. Poor households often try to adjust by reducing their expenses, withdrawing children from school and seeking off new ways of sustaining themselves. All the victims try to salvage what they can, and those who are financially stable enough to acquire land elsewhere do so. Most of the communities around the environs of River are poor- they cannot, therefore, manage to make pre-arrangements to shield the effects of flooding before the actual flooding season begins. However, to cope with the flooding, most families react by shifting to other areas that are considerably safer and withdrawing their children from school. Most of the children are driven to fend for themselves by seeking new employment. This is mainly because low-income families have less to depend on during the flood season and may not, therefore, be able to provide for their families adequately.

However, most of the families around the river make some effort to save themselves from the effects of the flood by either moving to safer places completely or relocating their belongings. Amongst these people, there are some of the economically stable communities who do not make any efforts to seek for alternative lands or acquire new houses because they are reluctant to move from a place that they have been used to, and a place that is most probably fertile, and therefore, more preferable to them to any other place.

These findings were supported by Abdullah's (2017) study on the Impact of river Shabelle flooding on the environment. The study suggests that river Shabelle flooding has a negative impact on community development. According to SWALIM(Somalia Water and Land Information Management) (2009), floods have a dire impact on the lives of surrounding communities, and have negative impacts on community development such as infrastructural damage, a dire financial impact and displacement of communities. The findings of the effect of River Shabelle flooding on community development in Baledweyne District is complemented by other previous studies as indicated in the study document..

5.3 Conclusions

The purpose of this study was to evaluate community perception study of on the impact of Shabelle River floods on livelihood in Baledweyne District, Somalia. Following were the major findings from the study.

- i. The Major causes of Shebelle river floods in Baledweyne district was the massive water accumulated from atop the Ethiopian highlands. The more significant part of the catchment area of river Shabelle is in the upper parts of Ethiopia, whose waters mostly contribute to the inflows of the river at Shabelle and the Juba Rivers.
- ii. The high rainfall in the upper catchment areas is the most significant reason why the river floods. Furthermore, the weak river regulation structures or none existence around the banks of the river also contribute to the flooding of the river.
- iii. The declining forestry around Shabelle means that there is less natural vegetation to contain the floods, and the water finds a free course around its banks.
- iv. The evaluation of the Impact of River flooding on social-economic livelihoods agreed. Most of the respondents indicated that the flooding of River Shabelle affects social-economic livelihoods of the communities around the river. The evaluation the coping mechanisms practiced by the local people, the respondents agreed that to make Preparing before flood coming to decrease the hazards of the River flooding. Poor households often try to adjust by reducing their expenses, withdrawing children from school and seeking off new ways of sustaining themselves.
- v. All the victims try to salvage what they can, and those who are financially stable enough to acquire land elsewhere do so. Consistent with findings, the results also showed that most of the residents in Beledweyne there is no preparation before the onset of floods to decrease the hazards of from the flooding. Overall, the results showed that flooding has a negative impact on community development and on the environment, including massive destruction of agricultural crops, infrastructural damage, a dire financial impact and displacement of communities.

5.4 Recommendations

Each year, rains are predicted for April – June with potential flood risks in Beledweyne, Hirshabelle among other areas in the country. It is therefore appropriate in this research report to highlight some policy consideration which, if implemented could play an important role to reduce flood effects on community living in Baledweyne. The following policy considerations are recommended:-

- i. Raising Public Awareness: Public awareness and civic education component should be invested to reduce flood risk and mobilize the community around critical and cross sectorial issues such as; flood early warnings, safe settlements, health and environment, waste management, water treatment/safe water storage, sanitation and hygiene.
- ii. De-silting the River – Wastes and accumulated sand should be removed from the riverbed trees and rubbish from the riverbanks to expand the water flow space and preventing breakages resulting from the pressure of the river.
- iii. Rehabilitation of Existing Waraboole Canal: The complete rehabilitation and soil removal of Waraboole canal, which has seven floodgates that were manually operated that would allow excess water from the river during high flow seasons to flood an area of about 12 km square before it flows back into the river.
- iv. Building New Canal at Hilo-Kilyo: Managing flash floods by building a new canal connecting from Hilo-Kilyo riverside to Guufaale, which is 62,250m (6.25km). This new canal will channel flash flood water sources all together from Hilo-Kilyo 7km North end of the city and will join to inject water to the river at Guufaale point Southside of the city.
- v. Re-establishing River Management Authority: Long-term plan requires special institutional arrangement such as National River Management Authority, a central agency to manage the river water for flood protection, water reservations, basin repair and, excess soil removal from the bottom, general maintenance work and water use. The agency existed before the civil war and the fall of the central government in Somalia. Therefore, reestablishing the agency with a federal mandate is a very realistic and a step in the right direction.

- vi. **Water Reservoirs:** Build water reservoirs to catch flood water to be used later for irrigation, livestock consumption and to return back to the river when the water levels reduce.
- vii. **Protection of Vital Lifeline Facilities:** Devising and adopting new ways of protecting the most important facilities such as electricity and water. Restoration of educational institutions, health care systems, and counseling should be given priority.

5.5 Areas for further studies

More studies should be done in each village in Baledweyne on the same topic of study to evaluate flood risk management for long term reliance and to seek to establish the effectiveness of adaptation methodologies employed by local people in response to climate change.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

5th March, 2020

Ahmed Mohamed Eimoi

Dear Respondent,

RE: COLLECTION OF DATA

I am a student of Masters of Arts degree in Water Resource Management, in the University of Nairobi. It is a requirement for me to submit a research project assessment. My project title is Impact of Shebelle River on community development case study Baledweyn district. I therefore request your assistance in completing the questionnaire hereby attached.

Kindly answer all the questions correctly.

The research results were used for academic purposes only and were treated with confidentiality. Your cooperation was appreciated.

Yours Faithfully,

Ahmed Mohamed Eimoi

APPENDIX 2: QUESTIONNAIRES

SECTION ONE: Respondent information.

Please kindly tick the provided space.

Sex: Male Female

Age: a) 18-30 b) 30-49 c) 50 and above

Marital status: Single Married

Education level: Primary Secondary Diploma

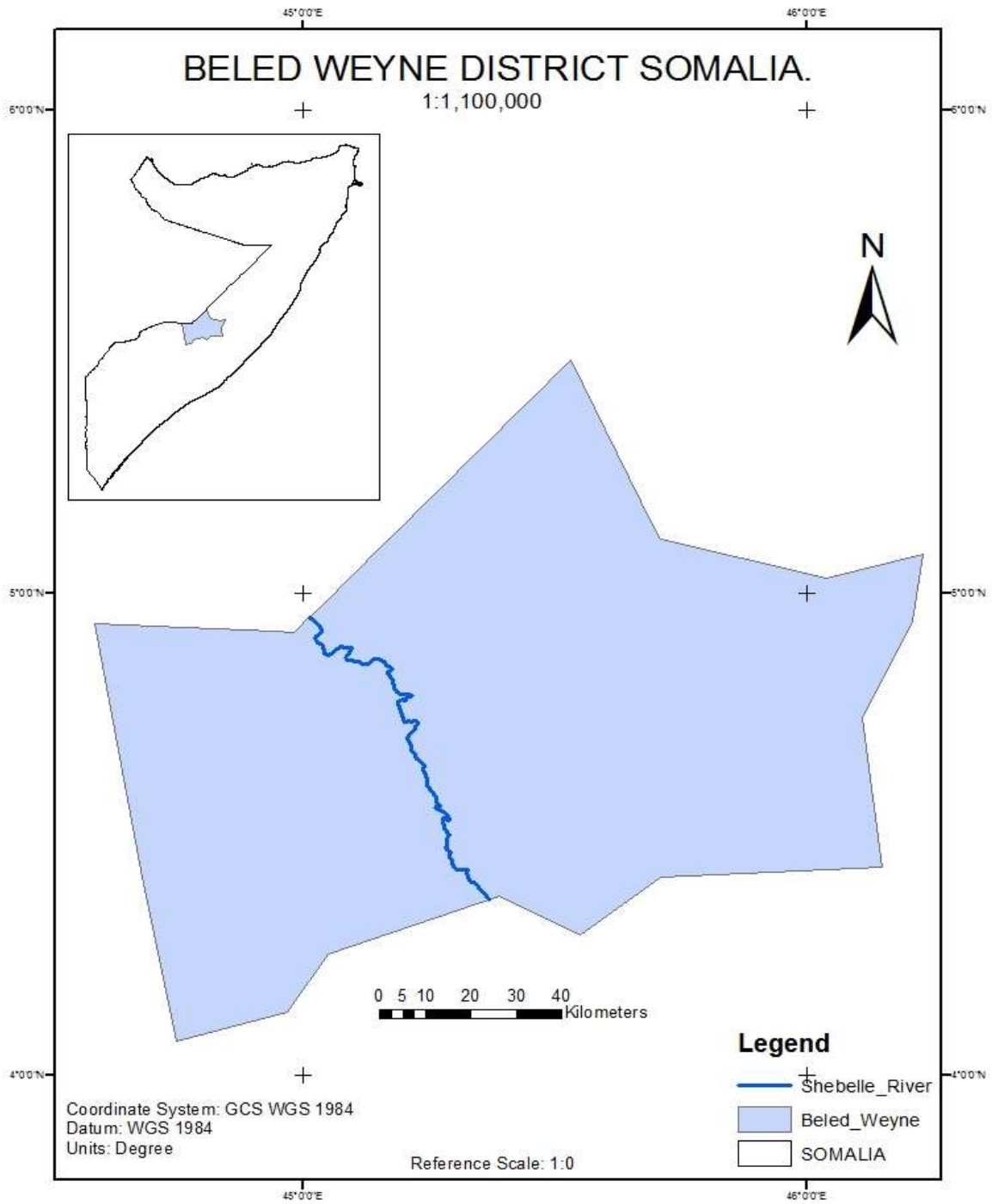
Bachelor Master

SECTION TWO: Indicate your preferred option on the space given after each item. The guide below may help.

Response mode rating	Description	legend
Strongly agree (4)	you agree with no doubt at all	SA
Agree (3)	you agree with some doubt	A
Disagree (2)	you disagree with some doubt	D
Strongly disagree (1)	you disagree with no doubt at all	SD

A) Major causes of Shabelle river floods	1	2	3	4
1. Heavy rains come from the highlands of Ethiopia				
2. Lack of control structures of river banks and poor drainage system causes floods				
3. Deforestation may bring floods.				
4. Improper use of river irrigation induces floods				
B) : impact of flood on social-economic livelihood				
1. River Flooding causes Loss of lives and property				
2. Floods damage infrastructures				
3. River Flooding increase mass migration or population displacement				
4. Flood decreases farm productivity				
C) The Coping Mechanisms Practiced By the Local People				
1. There is no preparation for the flood to reduce losses				
2. Poor households usually cope by reducing expenses, withdrawing children from school and looking for new ways of sustaining themselves				
3. The victims try to salvage what they can				
4. Households that are financially stable can acquire land somewhere else				

STUDY MAP



FIELD WORK

