

BUSITEMA UNIVERSITY
FACULTY OF SCIENCE AND EDUCATION
DEPARTMENT OF GEOGRAPHY

**IMPACT OF LANDSLIDES ON THE SOCIO-ECONOMIC ENVIRONMENT
OF NAMETSI SUB-COUNTY, BUDUDA DISTRICT, EASTERN UGANDA**

BY
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STATEMENT OF DECLARATION

I, Wetunga Grace, declare that this research report is my own original work and has not been submitted to any other university or institution of higher learning for the award of a degree or any other academic qualification. Where other people's work has been used, this has been duly acknowledged.

Signature: 

Date: 19/08/2026

ENDORSEMENT BY THE SUPERVISOR

This research report has been submitted for examination with the approval of the university supervisor.

Supervisor's Name: MR. TURAHABWE REMIGIO

Signature: 

Date: 19/08/2026

DEDICATION

This research report is dedicated to my lecturers, led by Mr. Turyahabwe Remigio, for their guidance, patience, and academic support throughout my studies. It is also dedicated to my father, Kuteyi Rogers Mutsuma, and my mother, Nandeya Florence, whose love, sacrifice, and encouragement have been the foundation of my education. Finally, I dedicate this work to my husband, Kutosi Milton David, for his unwavering support, understanding, and encouragement throughout this research journey.

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ABSTRACT

This study assessed the effects of landslides on the socio-economic environment of Nametsi Sub-County, Bududa District, Eastern Uganda. Landslides have long threatened communities on the slopes of Mount Elgon, destroying farmland, infrastructure, and livelihoods, yet limited empirical attention has been paid to their detailed socio-economic effects at the sub-county level. The study was guided by three objectives: to identify the physical and human causes of landslides in the area, to examine their socio-economic effects on households and communities, and to evaluate existing mitigation strategies. A cross-sectional descriptive research design was adopted, employing a mixed-methods approach that combined structured household questionnaires, key informant interviews, focus group discussions, and secondary data review. Data were collected from 90 respondents drawn from Nametsi, Bunakasala, and Bukalasi villages using purposive and simple random sampling techniques. The findings revealed that heavy and prolonged rainfall (92.9%), deforestation (78.6%), and steep slopes (71.4%) were the most frequently cited causes of landslides in the area. The majority of households (78.6%) reported losing at least a quarter of their farmland to landslides, while a similar proportion experienced a decline in household income, with 42.9% reporting that their income had more than halved. Infrastructure such as roads, schools, and health facilities was also damaged, disrupting access to essential services, while displacement and heightened concern for personal safety were reported across the study villages. Existing mitigation measures, including afforestation, terracing, community sensitization, and resettlement programmes, were found to be constrained by limited resources, weak enforcement, and community resistance rooted in attachment to ancestral land. The study concludes that landslides have significantly undermined agricultural productivity, household income, infrastructure, and social wellbeing in Nametsi Sub-County, and recommends strengthened community-based disaster risk reduction, sustainable land management, and more inclusive resettlement planning to build long-term resilience.

ACRONYMS

FGD — Focus Group Discussion

GDP — Gross Domestic Product

GoU — Government of Uganda

IPCC — Intergovernmental Panel on Climate Change

LC1 — Local Council One

LCIII — Local Council Three

NGO — Non-Governmental Organization

OPM — Office of the Prime Minister

SDG — Sustainable Development Goal

UBOS — Uganda Bureau of Statistics

UNDRR — United Nations Office for Disaster Risk Reduction

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter presents the background to the study, the problem statement, the purpose and aim of the study, the specific objectives and research questions that guided the study, the significance of the study, and an overview of how the report is structured.

1.2 Background to the Study

Landslides are broadly defined as the movement of a mass of rock, debris, or earth down a slope under the direct influence of gravity. The term encompasses a wide range of ground movement processes, including rock falls, deep slope failures, and shallow debris flows (Varnes, 1978). The classification developed by Varnes remains one of the most widely used systems in geomorphology and engineering studies because it categorizes landslides according to the type of material involved, such as rock, debris, or earth, and the form of movement, including falls, topples, slides, spreads, and flows. Later, Hungr et al. (2014) revised this framework to incorporate advances in scientific understanding of slope failure mechanisms. Their revision distinguished between rotational and translational slides, where movement occurs along specific failure planes, and flow-type landslides in which saturated materials move in a fluid-like manner. The causes of landslides are varied and often interconnected. Among the most common triggers is intense or prolonged rainfall, especially in tropical and subtropical mountainous areas where heavy precipitation saturates the soil, increases pore-water pressure, and weakens slope materials (Guzzetti et al., 2008). Other important triggers include earthquakes, volcanic activity, river erosion, road construction, quarrying, and deforestation. The removal of vegetation cover is particularly significant because plant roots normally help stabilize slopes by binding soil particles together. According to Sidle and Ochiai (2006), while triggering events initiate slope failure, underlying predisposing factors such as steep slope gradients, geological structure, soil type, and land use history determine the long-term susceptibility of an area to landslides. Researchers further classify landslides into shallow and deep-seated types depending on the depth of the failure surface. Shallow landslides usually affect the upper one to three metres of soil and are commonly associated with short-duration but intense rainfall events. These are especially common in agricultural landscapes where cultivation disturbs soil structure and removes natural vegetation cover (Kitutu et al., 2009). Deep-seated landslides involve larger volumes of material and occur along deeper geological weaknesses such as faults, joints, or contacts between rock layers. Although they tend to move more slowly, they often result in more widespread and long-lasting damage. Both shallow and

deep-seated landslides are relevant in Nametsi Sub-County, where steep volcanic slopes, highly weathered soils, heavy rainfall, and extensive deforestation combine to create highly unstable environmental conditions.

The socio-economic environment refers to the interconnected social, economic, and institutional conditions within which individuals and communities organize their lives and livelihoods. It includes factors such as income levels, employment opportunities, and access to land, housing, education, healthcare, and markets, as well as social relationships, cultural norms, and governance systems that influence people's wellbeing and ability to cope with challenges (Chambers & Conway, 1992). The concept is important in development studies because it reflects both the material conditions and social structures that shape people's quality of life and resilience. In natural hazard research, the socio-economic environment is viewed both as a determinant of vulnerability and as an area affected by disasters. Poor and marginalized communities are often forced to settle in hazard-prone locations because of land scarcity and poverty, making them more exposed to disasters such as landslides. At the same time, disasters damage livelihoods, destroy infrastructure, reduce income sources, and disrupt social systems, thereby weakening the socio-economic functioning of affected communities. Wisner et al. (2004) described this relationship through the concept of differential vulnerability, arguing that socio-economic inequalities result in unequal exposure to hazards and unequal capacity to recover from disaster impacts.

In the Mt. Elgon region of Uganda, where poverty levels remain high and agriculture is the main economic activity, the socio-economic environment is particularly vulnerable to landslide disasters. Landslides destroy farmland, homes, roads, water sources, schools, and health facilities, thereby affecting livelihoods, food security, access to services, and community stability. Understanding the effects of landslides on the socio-economic environment therefore requires examining not only the physical destruction caused but also how existing poverty, land pressure, governance challenges, and social inequalities influence the severity of impacts and the ability of communities to recover. This study adopts a holistic understanding of the socio-economic environment by examining how landslides affect agricultural productivity, household livelihoods, infrastructure, displacement, and access to essential social services in Nametsi Sub-County. The study also recognizes that the impacts of landslides differ across groups depending on factors such as gender, age, income level, and location.

Globally, landslides are recognized as one of the most destructive natural hazards because of their significant impacts on human lives, livelihoods, infrastructure, and economic

development. Froude and Petley (2018), using a global fatal landslide database covering the period 2004--2016, documented 4,862 fatal landslide events that caused approximately 55,997 deaths in 138 countries. Their findings showed that the highest fatality rates occurred in tropical and subtropical developing countries where steep terrain, intense rainfall, rapid population growth, and weak disaster management systems combine to increase vulnerability. The United Nations Office for Disaster Risk Reduction (UNDRR, 2020) estimated that landslides and related disasters cause annual economic losses amounting to billions of dollars worldwide. The socio-economic impacts of landslides are multidimensional. In many developing countries, rural populations depend heavily on agriculture for survival, making them particularly vulnerable when landslides destroy farmland. Petley (2012) noted that the majority of landslide victims globally are rural farmers whose livelihoods depend directly on land resources. Landslides bury crops, erode fertile soils, and render agricultural land unproductive, leading to severe food insecurity and long-term income loss. Schuster and Highland (2007) found that in many agrarian economies, agricultural losses resulting from landslides often exceed the value of destroyed physical property because farmland remains unusable for many years after major events. Infrastructure destruction is another major consequence of landslides worldwide. Roads, bridges, schools, hospitals, and water systems located in mountainous areas are highly vulnerable to slope failures. When infrastructure is destroyed, access to markets, healthcare, and education becomes difficult, further deepening poverty and underdevelopment. According to the World Bank (2010), natural disasters in low-income countries can destroy infrastructure worth two to three percent of GDP in a single event, thereby reversing years of development progress.

In addition to economic and physical losses, landslides also have serious social and psychological consequences. Displacement from ancestral land disrupts community cohesion, cultural identity, and social support systems. Gaillard et al. (2007) emphasized that trauma, fear, and social disintegration are often overlooked dimensions of disaster impacts despite their importance in long-term recovery. The Sendai Framework for Disaster Risk Reduction 2015--2030 therefore highlights the importance of strengthening socio-economic resilience and addressing the underlying vulnerabilities that increase disaster risks (UNDRR, 2015).

In Africa, landslides have historically received less attention compared to hazards such as droughts and floods. However, recent studies indicate that landslide disasters are becoming increasingly common and destructive across the continent. Jacobs et al. (2016), who compiled records of fatal landslides in sub-Saharan Africa from 1973 to 2014, identified Uganda,

Ethiopia, the Democratic Republic of Congo, Cameroon, and Nigeria as some of the countries most affected by landslide disasters. They further noted that the actual scale of impacts is likely underestimated because many rural events go unreported. The socio-economic effects of landslides in Africa are severe because many communities rely on rain-fed subsistence agriculture and have limited resources for disaster preparedness and recovery. The Food and Agriculture Organization (FAO, 2015) reported that agriculture employs more than 60% of the labor force in sub-Saharan Africa, meaning that destruction of farmland directly threatens household food security and income. Nobile et al. (2018), studying landslides in the Kivu region of the Democratic Republic of Congo, found that affected households experienced income losses ranging from 50--70% after major landslide events. Recovery was slow because most households lacked savings, insurance, or government support mechanisms.

Climate change has also increased landslide risk across Africa. The Intergovernmental Panel on Climate Change (IPCC, 2021) observed that changing rainfall patterns and increasing rainfall intensity are likely to increase the frequency of landslides in tropical mountain regions. Kirschbaum et al. (2010) projected that rainfall-triggered landslides in tropical Africa could increase significantly by the middle of the century due to climate change. This trend poses serious socio-economic risks to already vulnerable communities. Governance challenges further worsen the impacts of landslides in Africa. Twigg (2015) argued that many African countries lack comprehensive hazard mapping systems, effective land use planning policies, and functional early warning mechanisms. As a result, disaster management often focuses on emergency response rather than long-term risk reduction. Although countries such as Uganda and Rwanda have introduced disaster risk reduction policies, implementation at local levels remains weak because of limited funding, poor coordination, and low community participation (Wangalwa et al., 2021).

East Africa is among the regions most affected by landslides due to its mountainous terrain, volcanic geology, intense rainfall, and widespread deforestation. Mountain systems such as Mt. Elgon, the Rwenzori Mountains, Mount Kenya, and the Ethiopian Highlands are characterized by steep slopes and deeply weathered soils that are highly susceptible to slope failure (Kitutu et al., 2009). Rwanda has experienced some of the most severe landslide disasters in East Africa. Nobile et al. (2018) reported that between 2006 and 2016, landslides in Rwanda's Western Province caused over 500 deaths and displaced more than 80,000 people. The destruction of terraced agricultural land severely affected household livelihoods because many families depended entirely on farming for survival. In Ethiopia, Getahun and Meten (2021)

documented that the 2016 Godere landslide caused deaths, destroyed homes, and devastated agricultural land, leaving affected households dependent on humanitarian support.

Kenya has also experienced recurrent landslide disasters, especially along the slopes of Mt. Elgon, the Aberdare Ranges, and the Rift Valley escarpments. Kirschbaum et al. (2010) noted that landslides in Kenya's tea-growing highlands frequently destroy tea plantations, roads, and soil conservation structures, thereby affecting household income and local economies. Similar impacts have been observed in Burundi and the Democratic Republic of Congo, where landslides continue to affect agriculture, water supply systems, and settlement areas. A common observation across East Africa is that recovery from landslide disasters is often slow and incomplete, especially among poor households. Van Westen et al. (2014) argued that repeated disasters create a cycle of poverty because each event further weakens household assets, reduces savings, and undermines community resilience. Communities that experience frequent landslides, such as those in Bududa District, therefore face increasing vulnerability over time.

Uganda is one of the countries in East Africa most affected by landslides, particularly in the Mt. Elgon and Rwenzori regions. Kitutu et al. (2009) identified Bududa, Manafwa, Sironko, and Mbale districts as the area's most susceptible to landslides because of their steep slopes, highly weathered volcanic soils, heavy rainfall, and extensive deforestation for agriculture. The most devastating landslide event in Uganda occurred in March 2010 when massive debris flows struck Nametsi and Bunabira sub-counties in Bududa District. According to the Government of Uganda (GoU, 2010), the disaster caused more than 300 deaths, displaced approximately 7,000 people, and destroyed over 1,200 acres of farmland. Roads, bridges, water systems, schools, and health facilities were also severely damaged. The disaster represented a major setback to local development because it destroyed infrastructure and livelihoods that had taken decades to establish. Mugagga et al. (2012) found that the 2010 landslide significantly altered soil conditions in affected areas. Fertile topsoil was removed or buried under rocky debris, making cultivation difficult and reducing agricultural productivity. As a result, many households experienced chronic food insecurity and were forced to adopt alternative livelihood strategies such as casual labor and petty trade, which generated lower and less stable incomes than farming. Land degradation and deforestation have further increased landslide vulnerability in Bududa District. Mubea and Menz (2012) documented a major decline in forest cover between 1986 and 2010 as natural vegetation was cleared for banana and food crop cultivation

on steep slopes. Population pressure and land scarcity forced communities to settle and cultivate increasingly hazardous areas, thereby increasing exposure to landslide risks.

Subsequent landslide events in 2012, 2016, and 2018 worsened the socio-economic conditions of affected households. Bwambale et al. (2020) reported that households affected by the 2018 Bududa landslide experienced significant reductions in income due to crop destruction, livestock loss, and displacement. Many families struggled to recover because repeated disasters had already depleted their assets and coping capacities. These recurring events demonstrate the continuing vulnerability of communities in Bududa District and highlight the importance of effective disaster risk reduction and sustainable land management strategies.

Despite the frequent occurrence of landslides in Nametsi Sub County, there is still inadequate comprehensive research focusing specifically on their socioeconomic effects on households and community development. Most previous studies have concentrated on the physical and environmental causes of landslides while giving limited attention to the social and economic challenges experienced by affected communities. There is therefore a need for detailed research to assess how landslides affect livelihoods, income levels, social services, education, health, and overall community wellbeing in Nametsi Sub County. This study therefore seeks to assess the effectiveness of landslides on the socioeconomic environment of Nametsi Sub County in Bududa District. The findings of the study provided useful information for policymakers, local leaders, disaster management agencies, and development partners in designing effective mitigation strategies, improving disaster preparedness, and strengthening community resilience against future landslide disasters.

1.3 Problem Statement

Landslides pose a significant threat to agricultural livelihoods in sub-Saharan Africa, particularly among farmers who depend heavily on rain-fed agriculture. In Uganda, increasing temperatures, erratic rainfall patterns, and the rising frequency of extreme weather events have severely disrupted agricultural productivity and food security. Eastern Uganda, especially Bududa District on the slopes of Mount Elgon, is highly vulnerable due to its fragile terrain and dense population, which exacerbate the impacts of landslides. Bududa District in Eastern Uganda faces a persistent and escalating crisis of catastrophic landslides that have resulted in significant loss of life and the destruction of vital infrastructure and agricultural livelihoods, most notably the high-value Arabica coffee crop which sustains half of all local household income. This disaster cycle is driven by a complex, tri-faceted interaction between a naturally

precarious environments defined by steep volcanic slopes and high-intensity rainfall and unregulated human activities, such as rapid population expansion, widespread deforestation, and unsustainable over-cultivation. Existing mitigation and resettlement efforts have historically yielded poor results because they often fail to account for deep socio-cultural attachments to ancestral lands or involve the community in meaningful consultation, leading to mistrust and information asymmetry regarding policy options. Ultimately, the lack of up-to-date, localized evidence on these landslide drivers and the perceived inadequacy of current defensive measures hinder the development of effective interventions, leaving Bududa's population highly vulnerable to future outbreaks as landslides continues.

Nametsi Sub County is one of the areas most affected by recurrent landslides in Eastern Uganda. The sub county lies on the slopes Mt. Elgon, an area characterized by steep slopes, heavy rainfall, high population pressure, and continuous cultivation of fragile land. These conditions have increased the frequency and severity of landslides in the area. Over the years, landslide disasters have caused serious destruction to human life, property, infrastructure, and the environment, leaving many households in difficult living conditions. The repeated occurrence of landslides has created a persistent socioeconomic crisis in the area, yet many communities continue to live in highly vulnerable conditions with limited capacity to recover fully from the disasters. Landslides in Nametsi Sub County have led to the destruction of houses, roads, bridges, schools, health centers, water sources, and electricity lines. During major landslide events, many families lose their homes and are forced to relocate to temporary shelters or safer areas. Some households become permanently displaced and lose access to land that previously supported their livelihoods. In addition, the destruction of transport and communication networks disrupts the movement of people and goods, making it difficult for farmers to access markets, agricultural inputs, health services, and educational facilities. The damage to social infrastructure also interrupts the delivery of essential public services and slows down economic activities within the community.

The economy of Nametsi Sub County largely depends on subsistence agriculture, with most households relying on crop farming and livestock keeping as their main source of income and food supply. Landslides destroy farmland, bury crops, remove fertile topsoil, and reduce agricultural productivity. As a result, many households experience food shortages, declining incomes, and increased poverty levels. The loss of livestock, farming tools, and stored harvests further weakens household economic stability. Since agriculture is the backbone of the local economy, the repeated destruction of productive land has contributed to unemployment,

dependency on relief support, and reduced standards of living among the affected communities. The effects of landslides also extend to the social wellbeing of the population. Families affected by landslides often experience psychological stress, trauma, and insecurity due to loss of relatives, property, and livelihoods. Children could fail to attend school because of displacement, destruction of school facilities, or lack of financial support from parents whose incomes have been affected. Health conditions could also worsen because of poor sanitation in temporary camps, limited access to clean water, and reduced access to healthcare services after roads and health facilities are damaged. Vulnerable groups such as women, children, the elderly, and persons with disabilities are usually the most affected because they have fewer resources and limited coping capacity during disasters.

Despite interventions by the government, humanitarian organizations, and development partners through relief distribution, resettlement programmes, and awareness campaigns, landslides continue to affect communities in Nametsi Sub county. Many interventions have focused mainly on emergency response rather than long-term socioeconomic recovery and disaster preparedness. In some cases, resettlement programmes have faced challenges such as inadequate land, poor community adaptation, and resistance from affected households who prefer to remain on ancestral land. Consequently, many people continue to settle in high-risk areas due to poverty, land scarcity, and population pressure. Although several studies have been conducted on landslides in the region, most have concentrated on the physical causes, environmental impacts, and hazard mapping of landslides. Limited attention has been given to the detailed socioeconomic effects of landslides on households and communities in Nametsi Sub County specifically. There is inadequate empirical information on how landslides affect income levels, education, health services, food security, infrastructure, employment, and household livelihoods in the area. This lack of detailed information limits the ability of government agencies, planners, and non-governmental organizations to design effective policies and sustainable disaster risk reduction strategies that address the real needs have affected communities.

Therefore, this study sought to assess the effects of landslides on the socioeconomic environment of Nametsi Sub County in. The study intended to generate information that could support policymakers, local leaders, disaster management agencies, and development organizations in developing appropriate measures for disaster preparedness, mitigation, recovery, and sustainable community development in landslide-prone areas.

1.4 Purpose of the Study

The purpose of this study was to generate empirically grounded, localized evidence on how landslides have affected the socio-economic wellbeing of communities in Nametsi Sub-County, Bududa District, in order to support more effective disaster risk reduction, resettlement, and community development interventions. Whereas earlier research on landslides in the Mount Elgon region concentrated mainly on the physical and geological causes of slope failure, this study was intended to draw attention to the social and economic dimensions of the disaster, namely its effects on agriculture, livelihoods, infrastructure, migration, and social wellbeing, and to the mitigation measures that communities and institutions have adopted in response.

1.5 Aim of the Study

The aim of this study was to examine the effectiveness of landslides on the socio-economic environment of Nametsi Sub-County in Bududa District, Eastern Uganda, with a view to informing disaster risk reduction strategies and community development interventions.

1.6 Objectives of the Study

1.6.1 Specific Objectives of the Study

1. To identify and analyse the physical and human causes of landslides in Nametsi Sub-County, Bududa District.
2. To examine the socio-economic effects of landslides on households and communities in Nametsi Sub-County.
3. To evaluate existing solutions and strategies adopted at community, local government, and national levels to mitigate the impacts of landslides in Nametsi Sub-County.

1.7 Research Questions

1. What are the physical and human factors that cause landslides in Nametsi Sub-County, Bududa District?
2. What are the socio-economic effects of landslides on households and communities in Nametsi sub-County?
3. What solutions and strategies have been adopted to mitigate the impacts of landslides in Nametsi Sub-County, and how effective are they?

1.8 Significance of the Study

The significance of this study is multifaceted, addressing critical gaps in scientific knowledge, socio-economic stability, and public policy within one of Uganda's most disaster-prone regions. By examining the "tri-faceted" interaction of natural topography, climate change, and human activity, this research provides a vital foundation for protecting lives and securing the future of the Arabica coffee economy.

The following sections detail the expanded significance of the study across seven key thematic areas.

1.6.1 Advancing Human Safety and Public Health Resilience

The primary significance of this research lies in its potential to save lives in a region where landslides have claimed hundreds of individuals and displaced thousands more.

Preventing Fatalities: Historical data shows a recurring pattern of death, with major events in 1933, 1964, 1970, and 1997 culminating in the 2010 Nametsi landslide, which killed over 400 people. This study provides the localized evidence necessary to identify high-risk zones, allowing for more effective early warning and evacuation.

Protecting Health Infrastructure: Landslides do not just kill directly; they destroy the very systems meant to save lives. The total burial of the Nametsi Health Center II serves as a stark reminder of how disasters paralyze local health delivery. By informing better land-use planning, this study helps protect vital infrastructure from future mass movements.

Mitigating Secondary Health Crises: The destruction of water and sanitation systems following landslides often leads to outbreaks of communicable diseases like cholera and diarrhea. Understanding landslide dynamics is essential for maintaining the integrity of water systems and preventing these secondary public health emergencies.

1.6.2 Safeguarding the "Coffee Economy" and National GDP

Agriculture is the backbone of Bududa, with 86% of the population engaged in subsistence farming. This study is significant because it protects the economic lifeblood of both the region and the nation.

Protecting Household Income: Approximately 50% of household income in Bududa is derived from Arabica coffee. Landslides and climate variability cause colossal losses; for instance, the 2010 event destroyed 60,000 coffee trees, causing immediate and long-term poverty.

National Foreign Exchange: Coffee represents roughly 3% of Uganda's GDP and 20-30% of the country's foreign exchange earnings. Ensuring the resilience of coffee production in the Mount Elgon region is therefore a matter of national economic security.

Investment Justification: This research highlights that investments in Climate Smart Agriculture (CSA) such as terracing, mulching, and trench construction are not just environmental necessities but sound economic decisions, yielding an internal rate of return (IRR) of approximately 36%

1.6.3 Bridging the Evidence-Policy Gap

A critical significance of this study is its contribution to the scarcity of up-to-date, localized evidence required to guide disaster redress in Uganda

Downscaled Scientific Data: While general landslide models exist, this study provides downscaled landslides scenarios specifically for Bududa. This level of granularity is required for local authorities to make informed decisions on infrastructure and agricultural planning

Refining National Policy: The findings can be used to optimize the Uganda National Policy for Disaster Preparedness and Management (2010). By identifying where previous interventions--like landslides fell short (often being viewed as "white elephants"), this study offers a more community-integrated path forward.

1.6.4 Navigating Socio-Cultural Barriers to Resettlement

One of the greatest challenges in risk mitigation is the resistance to resettlement. This study is significant because it explores the deep-rooted cultural reasons for this resistance

Cultural Identity (Imbalu): Many residents are reluctant to leave because Bududa is the heart of the "Imbalu" (male circumcision) rite of passage, which is central to Bagisu identity. Moving to lowland districts like Kiryandongo can lead to cultural alienation.

Ancestral Attachments: Settling in high-risk areas is often driven by the assertion that these are "ancestral homes". This study provides a framework for policy makers to incorporate people's cultures and attitudes into disaster risk reduction, increasing the community's willingness to support interventions.

1.6.5 Promoting Environmental Sustainability and Conservation

The study addresses the anthropogenic accelerants that turn natural geological predispositions into human catastrophes

Combatting Deforestation: Rapid population growth (80% larger since the 1990s) has led to widespread tree cutting for fuel and timber. This research emphasizes how deforestation reduces root strength and soil stability, providing a scientific basis for aggressive reforestation programs.

Sustainable Land Management: By promoting practices like mulching and the planting of shade trees, the study shows how farmers can protect their soil from erosion and saturation while simultaneously improving their yields.

1.6.6 Integrating Indigenous Knowledge with Modern Science

This research recognizes that local communities are not passive victims but have developed their own indigenous knowledge systems over generations.

Warning Systems: Local indicators such as the behavior of birds, the position of the sun, or the appearance of cracks in the earth provide immediate warnings that electronic systems might miss. Traditional communication, such as drum beats, is often preferred over modern SMS alerts.

Community Acceptability: This study is significant because it seeks to integrate local practices with modern science. This hybrid approach ensures that early warning systems and mitigation techniques are both technologically sound and culturally acceptable to the local population.

1.6.7 Strengthening Local Institutional Capacity

Finally, the study provides a roadmap for the Bududa District Local Government to enhance its capacity for disaster response and adaptation.

Budgetary Planning: The research identifies that current institutional support budgets (around US\$4.9 million needed for comprehensive adaptation by 2019). This provides a data-driven justification for seeking increased funding from the central government and international donors

Inter-Sectorial Collaboration: By proving that the factors enabling landslides are "tri-faceted" (topography, climate, and human influence), the study highlights the need for cooperative participation between agricultural, environmental, and engineering departments

In summary, the significance of this study transcends academic inquiry. It provides the economic, cultural, and scientific evidence necessary to transform Bududa from a region defined by its vulnerability into a model for climate-resilient agriculture and proactive disaster management.

1.9 How the Report is Structured

This report is organized into five chapters, followed by conclusions and recommendations, references, and appendices. Chapter One presents the introduction and background to the study, the problem statement, the purpose and aim of the study, the specific objectives and research questions that guided the study, and the significance of the study. Chapter Two reviews related

literature on the causes of landslides, their socio-economic and environmental effects, and mitigation measures, drawing on global, African, East African, and Ugandan sources. Chapter Three describes the research methods used in the study, including the research design, study area, study population, sampling procedures, data collection instruments, data analysis techniques, validity and reliability considerations, ethical considerations, and the limitations of the study. Chapter Four presents the findings of the study organized according to the three specific objectives. Chapter Five interprets and discusses these findings in relation to the reviewed literature. The report closes with the conclusions and recommendations arising from the study, a list of references, and appendices comprising the research instrument, the introductory letter, the research timeline, and the research budget.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Landslides are among the most destructive natural hazards affecting mountainous regions across the world. They occur when masses of rock, soil, or debris move down a slope due to gravity. Landslides are common in areas with steep slopes, unstable soils, heavy rainfall, earthquakes, volcanic activity, and human interference with the environment. In developing countries, particularly in Sub-Saharan Africa, landslides have become a major environmental and socio-economic challenge because many communities depend directly on fragile mountainous ecosystems for agriculture and settlement.

Landslides are geomorphological events triggered by a combination of factors including rainfall, seismic activity, volcanic eruptions, and anthropogenic influences such as deforestation and slope modification. Froude and Petley (2018) conducted a comprehensive global database analysis and reported that between 2004 and 2016, at least 4,862 fatal landslides killed approximately 55,997 people worldwide. Their study highlighted Asia as the most affected continent, but noted growing incidence across Africa and Latin America. The economic costs of landslides are equally staggering; UNDRR (2020) estimated that natural hazards, of which landslides are a significant component, cost developing economies up to 30% of their annual GDP during disaster years.

Petley (2012) demonstrated that landslide fatalities are concentrated in mountainous regions of developing countries where population growth pressures force communities onto unstable slopes. His analysis pointed to the interplay between poverty, land scarcity, and disaster risk as a key driver of vulnerability. This observation is particularly relevant to the Nametsi context where population pressure on the slopes of Mt. Elgon has intensified over decades, increasing both exposure and sensitivity to landslide hazards. Hungr et al. (2014) further classified landslides into debris flows, rock slides, and earth flows, each with distinct velocities and destructive capacities, underscoring the need for hazard-specific assessments communities.

In Uganda, landslides are highly prevalent in the Mount Elgon region, especially in Bududa District in Eastern Uganda. Nametsi Sub County is among the most affected areas due to its steep terrain, high population density, heavy rainfall, and unsustainable land-use practices. Over the years, recurrent landslides in Bududa have caused loss of human life, destruction of property, environmental degradation, and displacement of communities, food insecurity, and disruption of economic activities.

Researchers have associated the increasing occurrence of landslides in Bududa District with both natural and human-induced factors. Natural factors include prolonged rainfall, steep slopes, weak geological formations, and climate change. Human activities such as deforestation, cultivation on steep slopes, overgrazing, poor farming methods, and population pressure have worsened slope instability and increased vulnerability to landslides (Khanakwa, 2023).

The socio-economic environment of Nametsi Sub County has been greatly affected by recurrent landslides. Agricultural productivity has declined due to soil erosion and destruction of farmland. Infrastructure such as roads, schools, bridges, and health centers has been damaged, thereby affecting service delivery and local economic development. In addition, affected communities experience psychological trauma, poverty, displacement, and social disorganization following landslide disasters (Wakalanga, 2015).

Various mitigation measures have been introduced to reduce landslide risks in Bududa District. These include afforestation, terracing, contour farming, community sensitization, early warning systems, relocation of vulnerable populations, and sustainable land management practices. However, despite these interventions, landslides continue to occur frequently due to inadequate implementation of environmental policies, population pressure, poverty, and climate variability.

This literature review examines previous studies related to the causes of landslides, the socio-economic and environmental effects of landslides, and the mitigation measures adopted to reduce landslide risks in Nametsi Sub County, Bududa District.

2.2 Causes of Landslides

Landslides result from a combination of natural and human-induced factors that weaken slope stability and trigger downward movement of soil and rock materials. In Bududa District, several studies have identified heavy rainfall, steep slopes, deforestation, population pressure, poor farming practices, and climate change as major causes of landslides.

Heavy Rainfall and Soil Saturation. Heavy rainfall is considered the leading trigger of landslides in Bududa District. According to Khanakwa (2023), prolonged rainfall increases water infiltration into the soil, thereby reducing soil cohesion and increasing slope instability. When soils become saturated with water, the frictional forces holding soil particles together weaken, causing the soil mass to slide downhill under the force of gravity. The Mount Elgon region receives high annual rainfall, particularly during the rainy seasons of March to May and

September to November. During these periods, intense rainfall leads to rapid accumulation of water within the soil layers. The excess water increases pore-water pressure, making slopes unstable and highly susceptible to landslides. Mukhone (2013) observed that most landslides in Bududa occur after several consecutive days of rainfall. The researcher further noted that rainfall intensity and duration are important determinants of landslide occurrence. Areas with poor drainage systems experience higher rates of landslide disasters because water accumulates easily within the soil profile. In addition, climate variability has contributed to unpredictable rainfall patterns in Eastern Uganda. Increased frequency of extreme rainfall events has intensified landslide occurrences in Nametsi Sub County and surrounding areas.

Steep Slopes and Geological Factor. The physical landscape of Bududa District contributes significantly to landslide occurrence. The district is located on the slopes of Mount Elgon, which is characterized by steep terrain and unstable geological formations. Steep slopes increase the gravitational force acting on soil and rock materials, thereby increasing the likelihood of slope failure. According to Namuenge et al. (2024), many areas in Bududa have deeply weathered volcanic soils that are highly prone to erosion and mass movement. The soils in the region are often loose and weakly consolidated, making them susceptible to collapse during heavy rainfall. Geological structures such as faults, fractures, and weak rock layers also contribute to slope instability. Weathering processes weaken rocks over time, creating conditions favorable for landslides. In addition, the presence of clay-rich soils in some parts of Bududa increases water retention capacity, which further weakens slope stability. The mountainous nature of Nametsi Sub County therefore creates a natural predisposition to landslides, especially when combined with other environmental and human factors.

Deforestation and Vegetation Loss .Deforestation is another major cause of landslides in Bududa District. Trees and vegetation play an important role in stabilizing slopes because their roots bind soil particles together and reduce soil erosion. Vegetation also helps regulate water infiltration and reduces surface runoff. However, increasing population pressure in Bududa has led to widespread deforestation for agriculture, settlement, and fuel wood. According to Austin and Mejia (2019), communities in Bududa heavily depend on subsistence agriculture and forest resources for survival. As a result, forests have been cleared extensively to create farmland and provide firewood. The removal of vegetation exposes soils to erosion and reduces the stability of slopes. Without adequate vegetation cover, rainwater flows rapidly over the land surface, carrying away topsoil and weakening the ground structure. Khanakwa (2023) further noted that deforestation has altered the ecological balance of the Mount Elgon ecosystem, thereby

increasing vulnerability to landslides. The loss of indigenous trees has reduced the ability of the environment to absorb and retain rainfall effectively.

Population Pressure and Settlement on Steep Slopes. Rapid population growth in Bududa District has increased pressure on available land resources. Due to land scarcity, many households have settled and cultivated on steep and fragile slopes that are highly vulnerable to landslides. Namuenge et al. (2024) observed that population density in Bududa District is among the highest in Uganda's mountainous regions. Families continue to subdivide land into smaller plots for cultivation and settlement, forcing communities to utilize marginal and environmentally sensitive areas. Settlement on steep slopes increases environmental degradation because houses, roads, and agricultural activities disturb the natural structure of the land. Human settlement also increases surface runoff due to removal of vegetation and soil compaction. In many cases, poor households lack alternative land for settlement and agriculture. Consequently, they remain exposed to landslide risks despite the dangers associated with living in high-risk areas.

Poor Farming Practices. Unsustainable agricultural practices contribute greatly to landslide occurrence in Nametsi Sub County. Common farming practices such as over-cultivation, bush burning, cultivation along steep slopes, and poor terracing methods weaken soil structure and accelerate soil erosion. According to Mukhone (2013), continuous cultivation without proper soil conservation measures reduces soil fertility and increases land degradation. Farmers in Bududa often cultivate crops such as bananas, beans, and coffee on steep slopes without adequate terracing. Overgrazing also contributes to vegetation loss and soil compaction, thereby increasing runoff and slope instability. In some cases, drainage channels are poorly managed, causing water accumulation and erosion during heavy rainfall. Austin and Mejia (2019) emphasized that poverty is a major factor influencing unsustainable land-use practices in Bududa. Poor households depend heavily on land for survival and therefore exploit fragile ecosystems intensively.

Climate Change. Climate change has increasingly been recognized as a contributing factor to landslide occurrence in Uganda. Changes in rainfall patterns, increased frequency of heavy storms, and rising temperatures have affected environmental stability in mountainous regions. Serwajja et al. (2024) noted that climate-induced hazards such as prolonged rainfall and extreme weather events have intensified landslides in Bududa District. Climate change increases rainfall unpredictability and contributes to severe flooding and soil erosion. The increasing occurrence of extreme rainfall events means that slopes remain saturated for longer

periods, thereby increasing the likelihood of slope failure. Climate change has therefore compounded existing environmental and socio-economic vulnerabilities in Nametsi Sub County.

2.3 Effects of Landslides on the Socio-Economic Environment

Landslides have severe socio-economic and environmental consequences for affected communities. In Bududa District, recurrent landslides have disrupted livelihoods, destroyed infrastructure, caused environmental degradation, and affected social wellbeing.

Loss of Human Life. One of the most devastating effects of landslides is the loss of human life. Bududa District has experienced several deadly landslides that have buried entire villages and killed hundreds of people. According to Wakalanga (2015), the 2010 Bududa landslide caused massive destruction and resulted in the death of many residents in Nametsi Parish. Families lost relatives, homes, and property within a short period. Loss of life has long-term social and economic implications for households and communities. Many families lose breadwinners, leaving children and dependents vulnerable to poverty and social insecurity. The emotional trauma associated with losing loved ones also affects the psychological wellbeing of survivors.

Destruction of Property and Infrastructure. Landslides cause extensive destruction of houses, roads, bridges, schools, health centers, and communication networks. Mudslides and debris flows bury buildings and damage public infrastructure. Nseka et al. (2021) observed that landslides disrupt transportation systems and limit access to markets, schools, and health facilities. Destruction of roads affects trade and movement of goods and services within affected areas. Damage to schools interrupts education activities, while destruction of health centers limits access to medical care during emergencies. Water supply systems are also affected when pipelines and springs are destroyed. The cost of repairing damaged infrastructure places a heavy financial burden on both government and local communities.

Agricultural Losses and Food Insecurity. Agriculture is the main economic activity in Nametsi Sub County. However, landslides destroy farmland, crops, and livestock, thereby reducing agricultural productivity. According to Wakalanga (2015), crops such as bananas, beans, coffee, and maize are often buried or washed away by landslides. This leads to food shortages and reduced household income. Soil erosion caused by landslides removes fertile topsoil, reducing the productivity of agricultural land. In addition, deposition of rocks and debris on farmland makes cultivation difficult. Food insecurity becomes common among affected households because agricultural production declines significantly after landslide disasters.

Poverty and Economic Decline. Landslides contribute to increased poverty levels among affected communities. Households lose property, crops, livestock, and sources of income during disasters. Austin and Mejia (2019) explained that repeated landslides trap communities in cycles of poverty because households spend resources on recovery rather than development. Economic activities such as trade and transportation are disrupted due to damaged roads and markets. Families are forced to depend on humanitarian assistance and government relief programs. The destruction of productive resources limits economic growth and reduces the capacity of households to improve their living standards.

Displacement and Resettlement. Landslides have displaced many households from high-risk areas in Bududa District. Some communities have been relocated to safer areas such as Kiryandongo and Bulambuli districts. Serwajja et al. (2024) noted that although resettlement reduces exposure to landslide risks, it also introduces new socio-economic challenges. Relocated communities often face difficulties in adapting to new environments. Challenges associated with resettlement include land conflicts, unemployment, inadequate social services, and cultural disintegration. Some relocated households lack access to fertile land for agriculture, which affects their livelihoods. In addition, many people resist relocation because of attachment to ancestral land and cultural identity.

Environmental Degradation. Landslides contribute significantly to environmental degradation. Soil erosion removes fertile topsoil and reduces land productivity. Nseka et al. (2021) observed that landslides destroy vegetation cover and increase sedimentation in rivers and wetlands. Sedimentation affects water quality and aquatic ecosystems. The destruction of forests and vegetation also affects biodiversity and ecological balance. Wildlife habitats are destroyed, while water catchment areas become degraded. Environmental degradation caused by landslides therefore undermines sustainable development in affected communities.

Psychological and Social Effects. Landslides have profound psychological and social impacts on victims. Survivors often experience trauma, stress, fear, and depression after disasters. Austin and Mejia (2019) reported that families affected by landslides experience emotional distress due to loss of relatives, homes, and livelihoods. Children may drop out of school due to displacement and poverty, while family relationships become strained because of economic hardships. Social disorganization also occurs when communities are displaced and traditional social networks are disrupted.

Increased Dependency on Relief Aid. Frequent landslides increase dependency on humanitarian assistance from government and non-governmental organizations. Affected households often require food aid, shelter, medical care, and financial support after disasters. While relief assistance helps communities recover temporarily, long-term dependency may reduce self-reliance and economic productivity. Repeated disasters therefore place pressure on national resources and slow down local development.

2.4 Mitigation of Landslide

Mitigation refers to measures aimed at reducing the occurrence and impacts of landslides. In Bududa District, various strategies have been introduced by government agencies, communities, and development partners to minimize landslide risks.

Afforestation and Reforestation. Afforestation and reforestation are among the most effective strategies for reducing landslides. Trees stabilize slopes through their root systems, which bind soil particles together and reduce erosion. According to Mukhone (2013), reforestation programs in Bududa District have helped restore degraded slopes and improve environmental conservation. Trees also reduce surface runoff by intercepting rainfall and increasing water infiltration into the soil. Indigenous tree species are particularly important because they adapt well to local environmental conditions. Community participation in tree planting programs is essential for long-term environmental sustainability.

Terracing and Contour Farming. Terracing and contour farming are important soil conservation techniques used in mountainous regions. Terraces reduce the speed of surface runoff and prevent soil erosion on steep slopes. Contour farming involves cultivating crops along contour lines rather than up and down slopes. Namuenge et al. (2024) observed that properly constructed terraces improve slope stability and increase agricultural productivity. However, some farmers in Bududa lack adequate knowledge and resources to implement effective terracing systems.

Sustainable Land Management. Sustainable land management practices are necessary for reducing environmental degradation and improving slope stability. These practices include agroforestry, crop rotation, mulching, controlled grazing, and proper drainage management. Khanakwa (2023) emphasized that sustainable agriculture helps maintain soil fertility and reduces land degradation. Integrated land-use planning is also important for controlling settlement and farming activities in high-risk areas.

Community Sensitization and Education. Community awareness programs play an important role in reducing vulnerability to landslides. Communities need knowledge about landslide causes, warning signs, and appropriate response measures. According to Khanakwa (2023), disaster preparedness training improves community resilience and enables households to respond effectively during emergencies. Local leaders, schools, and community organizations can help disseminate information about environmental conservation and disaster risk reduction.

Early Warning Systems. Early warning systems are designed to provide communities with timely information about potential landslide risks. These systems monitor rainfall patterns, soil movement, and environmental conditions that may trigger landslides. Namuenge et al. (2024) explained that early warning systems in Bududa District have improved disaster preparedness. However, challenges such as inadequate equipment, limited funding, and poor communication networks affect their effectiveness. Community trust and participation are also necessary for successful implementation of warning systems.

Relocation and Resettlement. Relocation of communities from high-risk areas to safer locations is another mitigation strategy adopted in Bududa District. The government of Uganda has relocated some vulnerable households to districts such as Kiryandongo. Serwajja et al. (2024) noted that although relocation reduces exposure to hazards, many communities resist moving because of cultural attachment to ancestral land. Successful resettlement requires adequate compensation, provision of social services, and livelihood support for relocated families.

Government Policies and Institutional Support. Government institutions play an important role in landslide mitigation through policy formulation, environmental regulation, and disaster management. Environmental laws aimed at controlling deforestation and settlement in fragile ecosystems are essential for reducing landslide risks. Local governments, non-governmental organizations, and international agencies also support environmental conservation and disaster preparedness programs. However, limited financial resources and weak enforcement of environmental regulations remain major challenges.

Integrated Disaster Risk Management. Integrated disaster risk management involves combining environmental conservation, community participation, scientific research, and policy implementation to reduce landslide risks. Researchers recommend that landslide mitigation strategies should involve collaboration among government agencies, local communities, environmental experts, and development organizations. Sustainable

development approaches that address poverty, environmental degradation, and climate change are necessary for long-term reduction of landslide disasters in Bududa District.

The reviewed literature indicates that landslides in Nametsi Sub County, Bududa District are caused by both natural and human-induced factors. Heavy rainfall, steep slopes, deforestation, population pressure, poor farming practices, and climate change are the major causes of landslide occurrence. Landslides have severe socio-economic and environmental effects including loss of life, destruction of property, food insecurity, poverty, displacement, environmental degradation, and psychological trauma. These effects undermine sustainable development and reduce the resilience of affected communities. Various mitigation measures such as afforestation, terracing, sustainable land management, community sensitization, early warning systems, and relocation programs have been introduced to reduce landslide risks. However, continued population pressure, poverty, climate variability, and weak policy implementation limit the effectiveness of these interventions.

The literature therefore highlights the need for integrated and sustainable approaches to landslide management in Bududa District. Strengthening environmental conservation, improving community awareness, enforcing land-use regulations, and addressing socio-economic vulnerabilities are essential for reducing landslide risks and improving community resilience's.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was employed in the study to assess the effectiveness of landslides on the socioeconomic environment of Nametsi Sub County in Bududa District, Eastern Uganda. The chapter describes the research design, study area, study population, sample size and sampling procedures, data collection methods and instruments, data analysis techniques, as well as validity and reliability considerations. Ethical considerations that guide the study are also presented. The methodology has been designed to ensure systematic collection and analysis of data relevant to the study objectives.

3.2 Research Design

The study adopted a cross-sectional descriptive research design. This design is considered appropriate because it enabled the researcher to collect data from a defined population at a single point in time in order to describe the nature and extent of a phenomenon. The design allowed the researcher to examine the socioeconomic effects of landslides among affected households in Nametsi Sub County within the available time and financial resources.

The study employed a mixed-methods approach involving both quantitative and qualitative methods of data collection and analysis. Quantitative methods enabled the researcher to obtain measurable information on variables such as agricultural losses, household income changes, food insecurity, and disruption of infrastructure and social services resulting from landslides. Qualitative methods provided deeper understanding of community experiences, perceptions, coping strategies, and institutional responses regarding landslide disasters.

3.3 Study Area

The study was conducted in Nametsi Sub County, located in Bududa District in the Elgon Sub-region of Eastern Uganda, approximately 235 kilometers east of Kampala. The sub county lies on the steep slopes of Mount Elgon at elevations ranging from about 1,400 to 2,200 metres above sea level. The area experiences a bimodal rainfall pattern, with long rains occurring between March and May and short rains between September and November. Annual rainfall ranges between 1,200 mm and 1,800 mm.

The soils in the area are mainly deep volcanic soils with high clay content that are highly susceptible to erosion and slope failure during periods of heavy rainfall. The population of Nametsi Sub County is estimated at approximately 18,000 people, predominantly belonging to

the Bagisu ethnic group. Most residents depend on subsistence and semi-commercial agriculture, particularly the cultivation of bananas, maize, and coffee

3.4 Study Population

The target population for the study comprised households in Nametsi Sub county that have been directly affected by landslides between 2010 and 2024. The study population included household heads and adult household members whose livelihoods, property, or access to services have been affected by landslides.

Overall, the study population totalled 102 people who had experienced direct effects of landslides during the period under study. The study population also included key stakeholders involved in disaster management and community development within the subcounty. These included local government officials, community leaders, health workers, and representatives from non-governmental organizations involved in disaster response activities

3.5 Sample Size and Sampling Procedures

3.5.1 Sample Size Determination

The sample size was determined using the population of 102 people as the respondents from four selected villages in Nametsi Sub-County. The population, sample size, and sampling technique used for each category of respondents are presented in Table 1.

Table 1: Population, Sample Size and Sampling Techniques

Category	Population	Sample Size	Sampling Technique
Households	20	14	Purposive sampling
Local community leaders	22	12	Simple random sampling
Focus group discussants	16	10	Simple random sampling
Key informants	20	16	Simple random sampling
Other residents	24	18	Simple random sampling
Total	102	90	All

3.5.2 Sampling Techniques

A multi-stage sampling procedure was used in selecting study participants.

In the first stage, three villages with a history of severe landslide occurrence were purposively selected. These villages included Nametsi Village, Bunakasala, and Bukalasi. Selection was based on district disaster reports and consultation with local authorities.

In the second stage, lists of landslide-affected households were obtained from Local Council One (LC1) Chairpersons in each selected village. Households were then selected using simple random sampling techniques

Key informants were purposively selected based on their knowledge, experience, and involvement in landslide disaster management and community development activities. These included the Subcounty Chief, LCIII Chairperson, District Environment Officer, NGO representatives, community health workers, and community elders.

Participants for focus group discussions were also purposively selected to ensure representation of different genders, age groups, and socioeconomic backgrounds. Separate discussions were conducted for men and women to encourage free participation and expression of views.

3.6 Data Collection Methods

The study employed four main data collection methods, namely structured household questionnaires, key informant interviews, focus group discussions, and secondary data review.

3.6.1 Structured Household Questionnaire

A structured questionnaire was used as the primary tool for collecting quantitative data from the selected households. The questionnaire was administered face-to-face with the assistance of trained research assistants.

The questionnaire consisted of four sections covering household demographic characteristics, agricultural and food security impacts, infrastructure and social service disruptions, and coping and adaptation strategies.

Both closed-ended and open-ended questions were included in the questionnaire. The instrument was first prepared in English and later translated into Lugisu to improve respondents' understanding.

3.6.2 Key Informant Interviews

Semi-structured interviews were conducted with selected key informants using an interview guide. The interviews sought information regarding the history of landslide occurrence, socioeconomic impacts, institutional responses, disaster management practices, and possible mitigation strategies.

The interviews were conducted in either English or Lugisu depending on the respondent's preference. With consent from participants, interviews were audio-recorded and supplemented with handwritten field notes.

3.6.3 Focus Group Discussions (FGDs)

Focus group discussions were conducted in the selected villages to obtain detailed community perspectives regarding the effects of landslides on livelihoods, agriculture, infrastructure, and social wellbeing. Each discussion group consisted of approximately 8--10 participants and was guided by a discussion guide prepared by the researcher.

3.6.4 Secondary Data Review

Secondary data was obtained from published and unpublished sources including government reports, district disaster records, NGO reports, population publications, meteorological records, and academic journal articles related to landslides and disaster management.

3.7 Data Analysis Methods

3.7.1 Quantitative Data Analysis

Descriptive statistical techniques such as frequencies, percentages, means, and standard deviations were used to summarize and present the data. Cross-tabulations were also conducted to examine relationships between household characteristics and the severity of landslide impacts.

The analyzed data was presented using tables, graphs, and charts.

3.7.2 Qualitative Data Analysis

Qualitative data obtained from interviews and focus group discussions was analysed using thematic content analysis.

The analysis process involved transcription of recordings, familiarization with the data, coding, identification of themes, interpretation of findings, and integration with quantitative results. Relevant quotations from respondents were used to support interpretation and discussion of findings.

3.8 Validity and Reliability

3.8.1 Validity

To ensure validity, the research instruments were reviewed by the research supervisor and other experts in the Department of Geography and Environmental Studies at Busitema University. Their comments and recommendations were used to improve the instruments before field data collection.

3.8.2 Reliability

Reliability of the study instruments was enhanced through pilot testing prior to the main study. Findings from the pilot exercise were used to revise unclear or ambiguous questions.

Research assistants also received training on data collection procedures to ensure consistency during administration of questionnaires and interviews. Standardized procedures were followed throughout the data collection process to minimize errors and improve reliability of findings.

3.9 Ethical Considerations

The researcher obtained an introductory letter from Busitema University before conducting fieldwork. Permission to conduct the study was also sought from Bududa District authorities and local leaders in Nametsi Subcounty.

Participation in the study was voluntary, and informed consent was obtained from all respondents before interviews or discussions were conducted. Respondents were informed about the purpose of the study and assured that the information they provided was treated confidentially and used strictly for academic purposes. And anonymity was maintained by avoiding the recording of respondents' names in questionnaires and reports. Participants were also free to withdraw from the study at any stage without any negative consequences.

3.10 Limitation of the Study

The findings of this study are limited to Nametsi Sub-County in Bududa District and should not be generalized to other landslide-prone areas of the Mount Elgon region or to Uganda as a whole, since the physical, social, and institutional conditions that shape landslide vulnerability vary considerably between locations.

The study was also limited in content scope. It examined the socio-economic dimensions of landslides, namely livelihoods, agriculture, infrastructure, migration, and social wellbeing, and did not extend to the geotechnical or hydrological investigation of slope failure mechanisms, which falls outside the discipline of Geography as applied in this research. Similarly, the assessment of mitigation measures was limited to the perceptions and experiences of respondents within the selected villages and did not extend to a full technical evaluation of engineering interventions such as slope stabilization works.

Finally, because the sample was drawn from four villages within Nametsi Sub-County using a combination of purposive and simple random sampling, the findings reflect the scale of impact within the selected communities and should be read as indicative of, rather than a full census of, the socio-economic conditions of the entire sub-county's landslide-affected population.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the findings of the study on the effects of landslides on the socio-economic environment of Nametsi Sub-County, Bududa District. The findings are organized according to the three specific objectives of the study: the causes of landslides, the socio-economic effects of landslides on households and communities, and the mitigation strategies adopted to reduce these effects. Findings are presented using frequency tables, percentages, and summaries of qualitative responses obtained from key informant interviews and focus group discussions. Out of the 90 respondents sampled, a response rate of 100 percent was achieved.

4.2 Demographic Characteristics of Respondents

Table 2 presents the demographic characteristics of the 14 household respondents who completed the structured questionnaire.

Table 2: Demographic Characteristics of Household Respondents (n = 14)

Characteristic	Category	Frequency	Percentage (%)
Gender of household head	Male	9	64.3
	Female	5	35.7
Age of household head	18–35 years	3	21.4
	36–55 years	7	50.0
	Above 55 years	4	28.6
Highest education level	No formal education	2	14.3
	Primary	6	42.9
	Secondary and above	6	42.9
Primary occupation	Subsistence farming	10	71.4
	Trade / business	2	14.3
	Other	2	14.3
Years lived in Nametsi Sub-County	Less than 10 years	2	14.3
	10 years and above	12	85.7

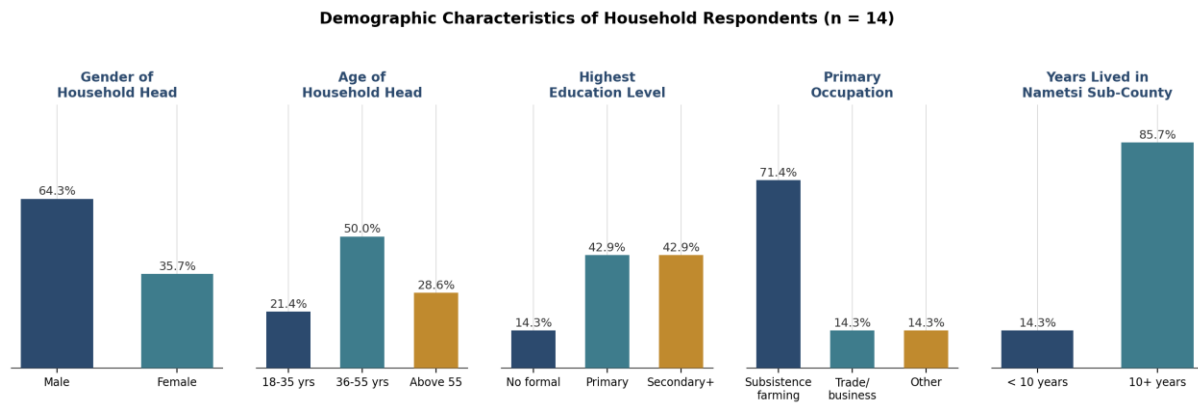


Figure 1: Demographic Characteristics of Household Respondents (n = 14)

Table 2 shows that the majority of household heads interviewed were male (64.3 percent) and aged between 36 and 55 years (50.0 percent). Most respondents had attained only primary-level education (42.9 percent), and the majority (71.4 percent) depended on subsistence farming as their primary occupation. The majority of respondents (85.7 percent) had lived in Nametsi Sub-County for ten years or more, indicating that most respondents had direct, long-term experience of the study area and its history of landslide occurrence.

4.3 Causes of Landslides in Nametsi Sub-County

Table 3 presents respondents' views on the main causes of landslides in the study area.

Table 3: Respondents' Perceptions of the Main Causes of Landslides (n = 14, multiple responses)

Cause	Frequency	Percentage (%)
Heavy / prolonged rainfall	13	92.9
Deforestation / tree cutting	11	78.6
Steep slopes	10	71.4
Farming on steep slopes	9	64.3
Population pressure / land shortage	8	57.1
Poor drainage systems	5	35.7
Weak / volcanic soils	4	28.6
Climate change	3	21.4

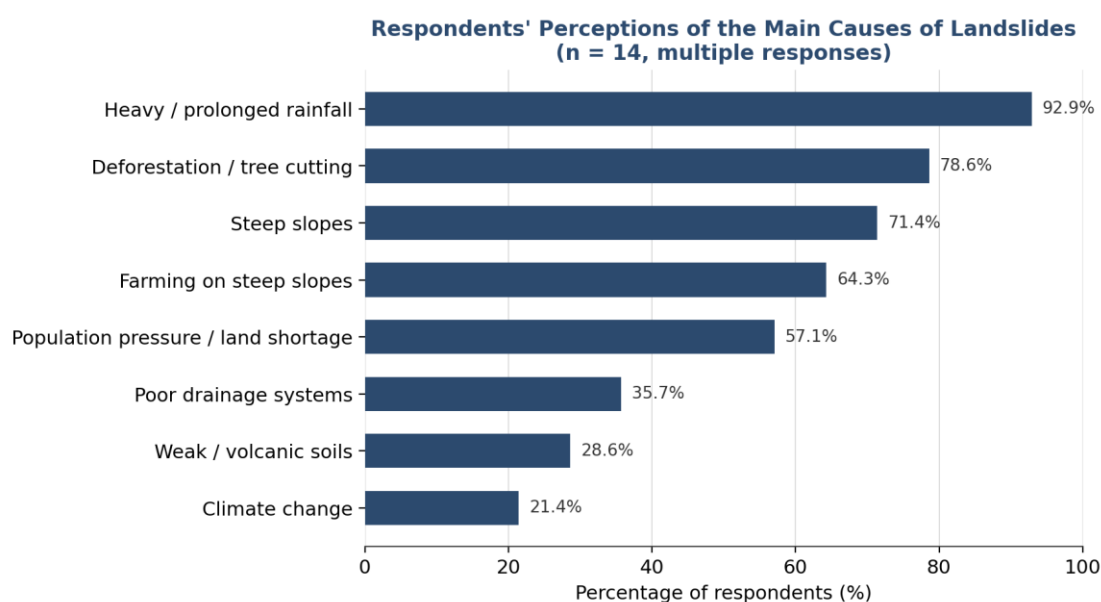


Figure 2: Respondents' Perceptions of the Main Causes of Landslides (n = 14, multiple responses)

Heavy or prolonged rainfall was cited by nearly all respondents (92.9 percent) as a leading cause of landslides in Nametsi Sub-County, followed by deforestation (78.6 percent) and the area's naturally steep slopes (71.4 percent). Farming on steep slopes and population pressure on available land were also frequently mentioned, reflecting the combination of natural predisposing conditions and human-induced factors identified in the reviewed literature. Regarding early warning, most respondents (10 of 14) reported that they had received no formal warning before the most severe landslide affecting their household, while a smaller number recalled community drum warnings. Key informants, including the Subcounty Chief and the District Environment Officer, corroborated these perceptions, emphasizing that unregulated cultivation on steep slopes and continued deforestation for fuelwood remained the most visible human drivers of slope instability in the area.

4.4 Socio-Economic Effects of Landslides

4.4.1 Effects on Agriculture and Food Security

Table 4: Extent of Farmland Destroyed by the Most Severe Landslide (n = 14)

Extent of Loss	Frequency	Percentage (%)
None	1	7.1
Less than 25%	2	14.3
25–50%	4	28.6
51–75%	4	28.6
More than 75% (total loss)	3	21.4

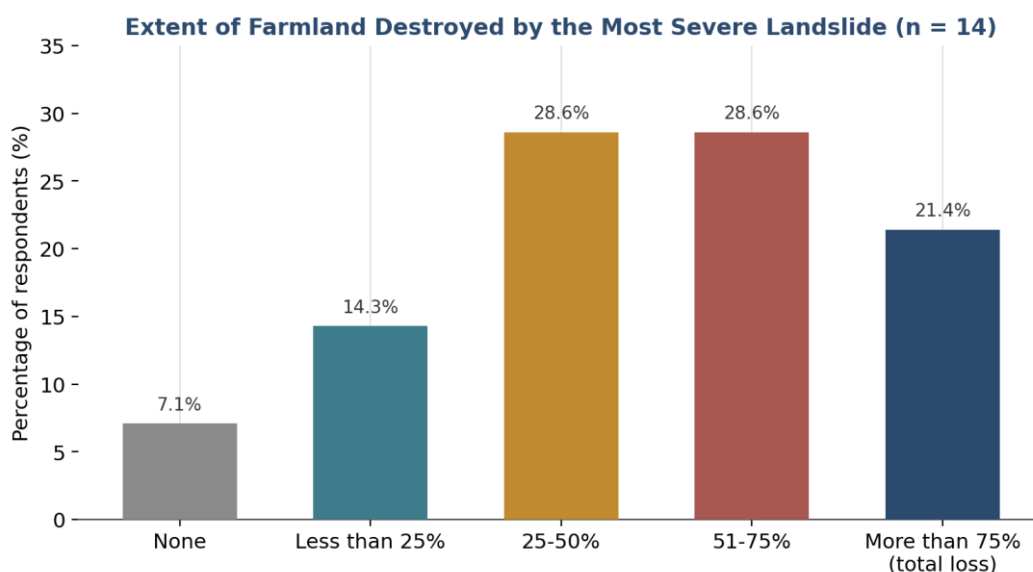


Figure 3: Extent of Farmland Destroyed by the Most Severe Landslide (n = 14)

The majority of respondents (78.6 percent) reported losing at least a quarter of their farmland to landslides, with 21.4 percent reporting total loss of their farmland. Bananas, maize, and coffee were the crops most frequently reported as destroyed. Respondents linked these losses directly to declining household food security and reduced income from the sale of Arabica coffee, corroborating findings from the literature on the centrality of coffee to household income in Bududa District.

4.4.2 Effects on Infrastructure and Access to Social Services

Key informants and focus group participants reported that roads, a water source, and a section of a primary school in the study villages had been damaged or destroyed by landslides at various times since 2010, disrupting access to markets, health services, and education. Community members described having to walk considerably longer distances to reach the nearest functional health facility following the destruction of a local health post.

4.4.3 Effects on Household Income and Livelihoods

Table 5: Reported Change in Household Income Following the Most Severe Landslide (n = 14)

Change in Income	Frequency	Percentage (%)
Decreased by more than half	6	42.9
Decreased by less than half	5	35.7
No noticeable change	2	14.3
Increased	1	7.1

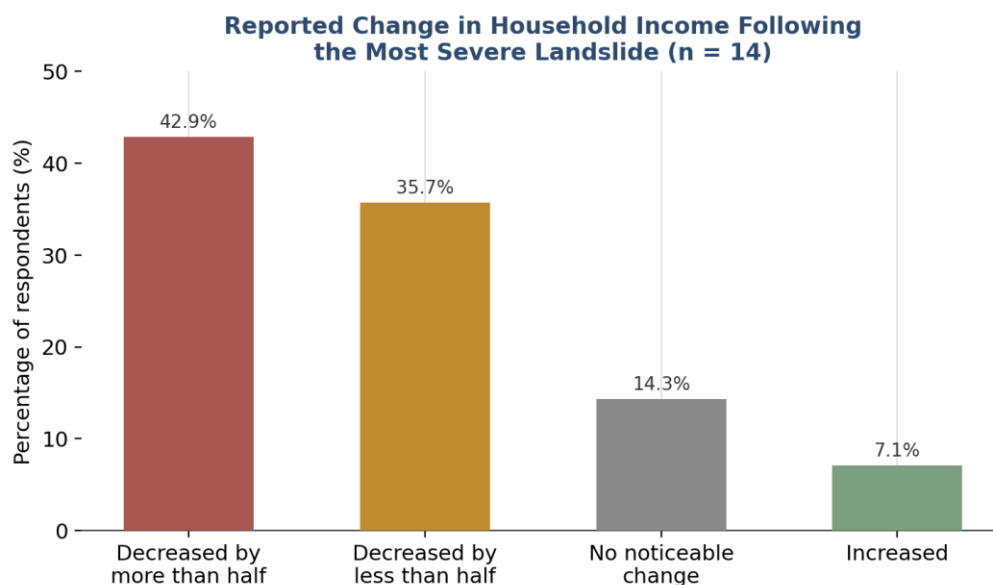


Figure 4: Reported Change in Household Income Following the Most Severe Landslide (n = 14)

Most households (78.6 percent) reported a decline in income following the most severe landslide affecting them, with 42.9 percent reporting that their income had more than halved. Respondents attributed this decline mainly to the loss of farmland and crops, and secondarily to the disruption of casual labour and petty trade opportunities in the area.

4.4.4 Displacement, Social and Psychological Effects

Table 6: Respondents' Rating of the Social Impact of Landslides (Mean Score, 1 = Not Affected, 5 = Severely Affected)

Indicator	Mean Score
Sense of personal safety and security	4.1
Community unity and cooperation	3.2
Trust in government/authorities to protect residents	2.6
Children's wellbeing and development	3.6
Ability to observe cultural traditions and practices	2.4

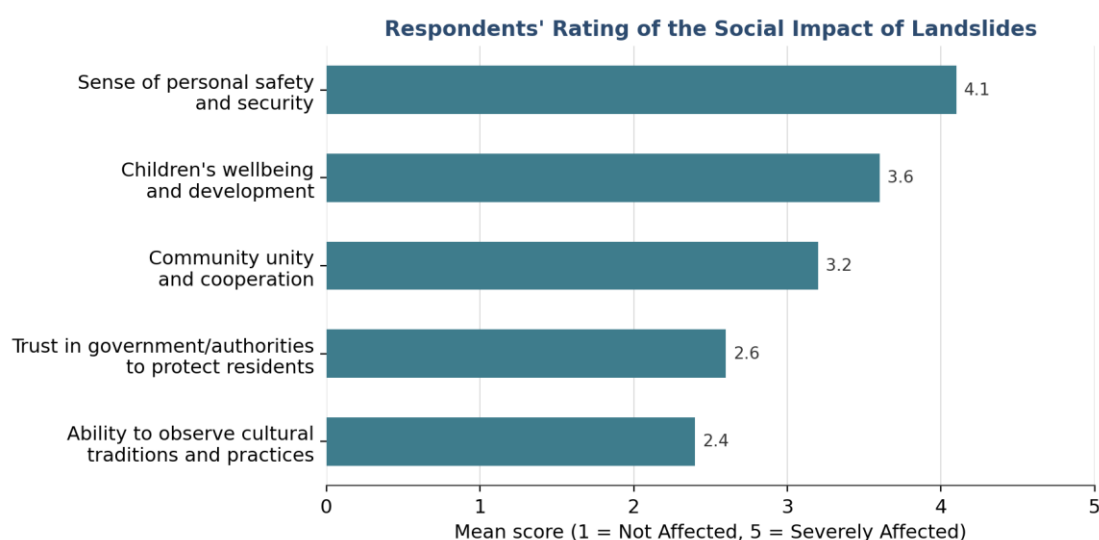


Figure 5: Respondents' Rating of the Social Impact of Landslides (Mean Score)

Respondents rated their sense of personal safety and security as the most severely affected indicator (mean score 4.1 out of 5), reflecting persistent anxiety about future landslide events. Trust in government and other authorities to protect residents received the lowest mean score (2.6), suggesting a perceived gap between community expectations and institutional response. A small number of households reported temporary or permanent displacement, with some relocating to safer parts of the sub-county and others resettling with relatives outside the district.

4.5 Mitigation Strategies and Community Responses

Table 7: Assistance Received by Households After a Landslide (n = 14, multiple responses)

Type of Assistance	Frequency	Percentage (%)
Food / emergency relief	9	64.3
Temporary shelter / tents	4	28.6
Agricultural inputs (seeds, tools)	3	21.4
Cash / financial support	2	14.3
No assistance received	4	28.6

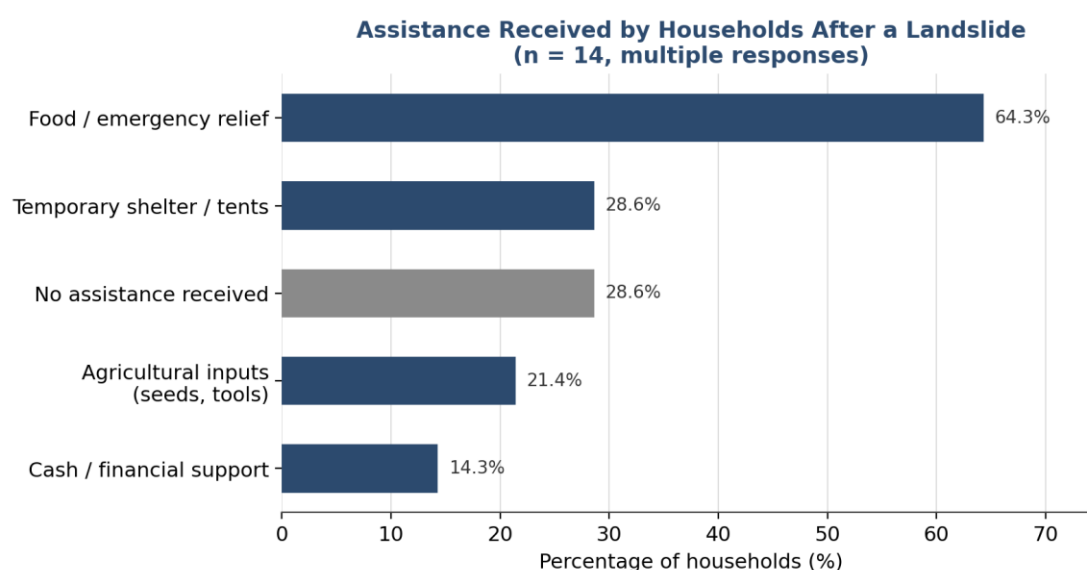


Figure 6: Assistance Received by Households After a Landslide (n = 14, multiple responses)

Table 8: Respondents' Rating of the Effectiveness of Mitigation Strategies (Mean Score, 1 = Very Ineffective, 5 = Very Effective)

Strategy	Mean Score
Reforestation / tree planting programmes	3.4
Terracing and contour farming	3.1
Community early warning systems	2.8
Government resettlement to safer areas	2.5
Awareness campaigns and community sensitization	3.0

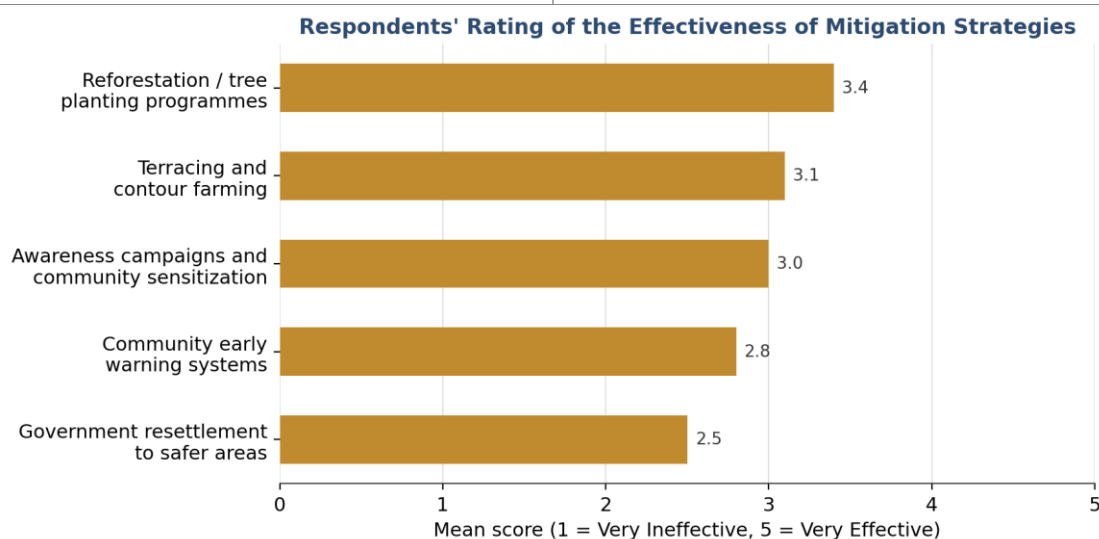


Figure 7: Respondents' Rating of the Effectiveness of Mitigation Strategies (Mean Score)

Table 7 shows that food and emergency relief was the most common form of assistance received (64.3 percent), while 28.6 percent of households reported receiving no assistance at all following a landslide. Regarding the perceived effectiveness of mitigation strategies (Table

8), reforestation and tree-planting programmes received the highest mean effectiveness rating (3.4), while government-led resettlement received the lowest (2.5). When asked whether they would be willing to relocate permanently to a safer area if support were provided, most respondents indicated conditional willingness dependent on financial and land support, while a smaller group cited cultural attachment to ancestral land as their main reason for preferring to remain despite the risk.

4.6 Summary of Findings

The findings presented in this chapter indicate that landslides in Nametsi Sub-County result from an interaction of heavy rainfall, steep slopes, deforestation, and population pressure on limited land. These landslides have had extensive socio-economic effects, including destruction of farmland and declining food security, damage to infrastructure and disruption of access to social services, reduced household income, and adverse social and psychological effects, particularly with regard to residents' sense of safety and their trust in government protection. While mitigation measures such as reforestation, terracing, and relief assistance have provided some support to affected households, they have not fully addressed the scale of socio-economic vulnerability in the area, and resettlement remains a contested option shaped by residents' cultural attachment to ancestral land.

CHAPTER FIVE: INTERPRETATION AND DISCUSSION OF FINDINGS

5.1 Introduction

This chapter interprets and discusses the findings presented in Chapter Four in relation to the literature reviewed in Chapter Two. The discussion is organized according to the three specific objectives of the study: the causes of landslides in Nametsi Sub-County, the socio-economic effects of landslides on households and communities, and the mitigation strategies adopted to reduce these effects.

5.2 Causes of Landslides in Nametsi Sub-County

The finding that heavy or prolonged rainfall was the most frequently cited cause of landslides is consistent with Khanakwa (2023) and Mukhone (2013), who similarly identified rainfall-induced soil saturation as the leading trigger of slope failure in Bududa District. The prominence given by respondents to deforestation as a second major cause reinforces Austin and Mejia's (2019) observation that population pressure in Bududa has driven extensive clearance of forest for agriculture and fuelwood, thereby exposing soils to erosion and reducing slope stability. The finding that population pressure and land shortage were also frequently cited supports Namuenge et al.'s (2024) argument that high population density on the slopes of Mount Elgon has forced households to cultivate increasingly marginal and hazardous land. Taken together, these findings confirm the "tri-faceted" interaction of natural topography, rainfall, and human activity that the literature identifies as characteristic of landslide risk in the Mount Elgon region, and suggest that mitigation strategies in Nametsi Sub-County need to address human-induced drivers of slope instability alongside natural hazard exposure.

5.3 Socio-Economic Effects of Landslides

The finding that most households lost a substantial share of their farmland to landslides, and that this loss was closely associated with declining household income, is consistent with Wakalanga's (2015) and Bwambale et al.'s (2020) findings that agricultural losses in Bududa District often exceed the value of destroyed physical property, given the length of time farmland remains unproductive after a major landslide event. The disruption of roads, water sources, and school infrastructure reported by respondents echoes Nseka et al.'s (2021) observation that landslides in mountainous areas routinely damage the very infrastructure that communities depend on for access to markets, healthcare, and education, thereby deepening the socio-economic consequences of the disaster beyond its immediate physical impact.

The relatively low mean rating that respondents gave to their trust in government and other authorities to protect them, compared with the higher-rated impact on personal safety, points to a gap between the scale of the disaster experienced by households and the institutional response available to them. This is broadly consistent with Twigg's (2015) argument that disaster management in many African countries remains oriented toward emergency response rather than long-term risk reduction, and with Serwajja et al.'s (2024) finding that resettlement and other institutional interventions in Bududa District have not always matched the scale or nature of community needs. The social and psychological effects identified in this study, including reduced community trust and disruption to cultural practice, reflect the "overlooked dimensions" of disaster impact that Gaillard et al. (2007) argue are often neglected relative to physical and economic losses, despite their importance for long-term community recovery.

5.4 Mitigation Strategies and Community Responses

The finding that reforestation and tree-planting programmes received the highest effectiveness rating among the mitigation measures assessed supports Mukhone's (2013) observation that such programmes have helped restore degraded slopes in parts of Bududa District, and reinforces the argument in the literature that vegetation cover plays a central role in stabilizing slopes and reducing surface runoff. By contrast, the comparatively low effectiveness rating given to government-led resettlement, together with respondents' conditional or reluctant attitudes toward permanent relocation, corroborates Serwajja et al.'s (2024) and Khanakwa's (2023) findings that resettlement programmes in Bududa District have often struggled to gain community acceptance because they do not adequately address residents' cultural and ancestral attachment to their land. This finding is significant for policy because it suggests that the success of future mitigation interventions in Nametsi Sub-County depends not only on the technical soundness of the measures proposed, but also on the extent to which they are designed and implemented in consultation with, and are acceptable to, the communities they are intended to protect.

The finding that food and emergency relief was the most commonly received form of post-disaster assistance, while a notable share of households reported receiving no assistance at all, is consistent with the literature's broader observation that disaster response in the region tends to prioritize short-term relief over longer-term recovery and risk-reduction support. This underlines the continuing relevance of Twigg's (2015) call for a shift from reactive emergency response toward more comprehensive, community-integrated disaster risk reduction planning in landslide-prone areas such as Nametsi Sub-County.

5.5 Summary

The discussion in this chapter has shown that the findings of this study are broadly consistent with, and extend, existing literature on the causes, effects, and mitigation of landslides in Bududa District and the wider Mount Elgon region. The findings reinforce the understanding that landslides in Nametsi Sub-County result from an interaction of natural and human-induced factors, that their socio-economic consequences are wide-ranging and mutually reinforcing, and that mitigation measures are more likely to be effective, and more likely to be accepted by communities, when they are consultative, address underlying human drivers of vulnerability, and are matched to the scale of need on the ground.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the findings of this study, three conclusions are drawn in line with the specific objectives of the study.

First, landslides in Nametsi Sub-County are caused by an interaction of natural and human-induced factors. Heavy and prolonged rainfall, steep volcanic slopes, and weathered soils create a natural predisposition to slope failure, while deforestation, cultivation on steep slopes, and population pressure on limited land intensify this predisposition. Addressing landslide risk in the area therefore requires attention to both the natural hazard environment and the human activities that increase exposure and sensitivity to it.

Second, landslides have had extensive and interconnected socio-economic effects on households and communities in Nametsi Sub-County. These include the loss of farmland and declining food security, destruction of infrastructure and disruption of access to social services, reduced household income and livelihoods, and adverse social and psychological effects, including diminished trust in the ability of government and other authorities to protect affected communities. These effects are mutually reinforcing: agricultural losses deepen poverty, which in turn reduces households' capacity to recover from and prepare for future disasters.

Third, while mitigation measures such as reforestation, terracing, community sensitization, and emergency relief have provided some support to affected households, they have not fully addressed the scale of socio-economic vulnerability in the area. Resettlement in particular remains a contested strategy, constrained by residents' cultural and ancestral attachment to their land, and its effectiveness depends heavily on the extent to which affected communities are genuinely consulted in its design and implementation.

Recommendations

Recommendations for community development

Local government and community-based organizations should scale up reforestation and terracing programmes in the most landslide-prone parts of Nametsi Sub-County, prioritizing indigenous tree species and community participation to strengthen both slope stability and local ownership of conservation efforts. Community-based early warning systems, including a combination of traditional indicators and simple modern tools, should be strengthened and better resourced to improve the timeliness of warnings ahead of severe rainfall events.

Recommendations for policy

Government agencies and development partners involved in resettlement and disaster response should adopt more consultative, community-integrated approaches that take into account residents' socio-cultural attachment to ancestral land, rather than relying primarily on relocation orders. Disaster response funding should be rebalanced to place greater emphasis on longer-term recovery support, including agricultural inputs and livelihood diversification, rather than short-term emergency relief alone. Land-use planning and enforcement in high-risk zones should be strengthened in coordination with agricultural extension services to reduce continued settlement and cultivation on the most hazardous slopes.

Recommendations for further research

Further research should track the medium- and long-term recovery trajectories of landslide-affected households in Nametsi Sub-County, including households that have been resettled, in order to assess the durability of livelihood recovery over time. Comparative research across other landslide-prone sub-counties in the Mount Elgon region would help determine whether the patterns identified in this study are specific to Nametsi Sub-County or reflect a broader regional pattern of socio-economic vulnerability to landslides.

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Note: All references above should be independently verified by the researcher against the original sources (exact titles, volume, issue, and page numbers) before final submission, in line with standard academic practice.

APPENDICES

Appendix I: Research Instrument

The household survey questionnaire used to collect data for this study is reproduced in full below.

BUSITEMA UNIVERSITY

Faculty of Science and Education — Department of Geography

HOUSEHOLD SURVEY QUESTIONNAIRE

Impacts of Landslides on the Socio-Economic Environment

Nametsi Sub-County, Bududa District, Eastern Uganda

Questionnaire No.: _____	Date of Interview: _____
Village: _____	Enumerator Name: _____
Parish: _____	Supervisor Initials: _____

 **INSTRUCTIONS TO ENUMERATOR:** Read each question aloud clearly. Circle or tick the appropriate response. Write legibly in spaces provided. Do NOT leave any question blank — write 'N/A' if not applicable. This survey is strictly confidential and for academic purposes only.

SECTION A: HOUSEHOLD DEMOGRAPHIC INFORMATION

A1. Name of Household Head (optional): _____

A2. Gender of Household Head:

☐ Male ☐ Female ☐ Other / Prefer not to say

A3. Age of Household Head (years):

☐ 18 – 25 ☐ 26 – 35 ☐ 36 – 45
☐ 46 – 55 ☐ 56 – 65 ☐ Above 65

A4. Highest level of education completed:

☐ No formal education ☐ Primary (P1–P7) ☐ O-Level (S1–S4)
☐ A-Level (S5–S6) ☐ Tertiary / University ☐ Vocational training

A5. Household size (total number of people living in this household): _____

A6. Marital status of household head:

- ☐ Single
 ☐ Married
 ☐ Widowed
 ☐ Divorced / Separated

A7. How long have you lived in Nametsi Sub-County?

- ☐ Less than 5 years
 ☐ 5 – 10 years
 ☐ 11 – 20 years
☐ 21 – 30 years
 ☐ More than 30 years (born here)

A8. Primary occupation / main source of income:

- ☐ Subsistence farming
 ☐ Commercial farming
 ☐ Casual labour
☐ Trade / business
 ☐ Government employment
 ☐ Other (specify below)

If other, specify:

SECTION B: EXPERIENCE WITH LANDSLIDE EVENTS

 This section captures your direct experience with landslides in Nametsi Sub-County since 2010.

B1. Has your household been directly affected by a landslide since 2010?

- ☐ Yes
 ☐ No

B2. Which landslide event(s) affected your household? (Tick all that apply)

- ☐ 2010 Nametsi landslide
 ☐ 2012 event
 ☐ 2016 event
☐ 2018 event
 ☐ Other years (specify below)

Specify other years:

B3. How many times has your household been directly affected by a landslide?

- ☐ Once
 ☐ Twice
 ☐ Three times
 ☐ Four or more times

B4. What was the season/time of year when the most severe landslide occurred?

- ☐ March – May (long rains)
 ☐ September – November (short rains)
 ☐ Dry season
 ☐ Not sure

B5. In your opinion, what are the MAIN CAUSES of landslides in this area? (Tick up to THREE)

- ☐ Heavy/prolonged rainfall
 ☐ Steep slopes
 ☐ Deforestation / tree cutting
☐ Farming on steep slopes
 ☐ Population pressure / land shortage
 ☐ Poor drainage systems

- ☐ Climate change ☐ Weak / volcanic soils ☐ Not sure

B6. Did you receive any warning before the most severe landslide hit?

- ☐ Yes — official warning (radio/text) ☐ Yes — community drum/local warning ☐ No warning received ☐ Partial warning only

SECTION C: EFFECTS ON AGRICULTURE AND FOOD SECURITY

C1. What is the approximate size of farmland your household owns/uses? (acres):

- ☐ Less than 0.5 acres ☐ 0.5 – 1 acre ☐ 1.1 – 2 acres
☐ 2.1 – 3 acres ☐ More than 3 acres

C2. How much of your farmland was destroyed or made unusable by the most severe landslide?

- ☐ None ☐ Less than 25% ☐ 25 – 50%
☐ 51 – 75% ☐ More than 75% (total loss)

C3. Which crops were destroyed or lost due to landslides? (Tick all that apply)

- ☐ Bananas / matoke ☐ Maize ☐ Beans ☐ Coffee (Arabica)
☐ Sweet potatoes ☐ Vegetables ☐ Root crops (cassava, yams) ☐ Other

C4. What happened to your livestock as a result of landslides? (Tick all that apply)

- ☐ No livestock affected ☐ Some animals killed ☐ All animals lost
☐ Animals displaced / lost ☐ Grazing land destroyed

C5. How long did it take for your farmland to recover and become productive again after the worst landslide?

- ☐ Still not recovered ☐ Less than 6 months ☐ 6 – 12 months
☐ 1 – 2 years ☐ 2 – 5 years ☐ More than 5 years

Food Security

C6. Did your household experience food shortages as a direct result of landslide damage to crops?

- ☐ No shortage ☐ Mild shortage (1–3 months) ☐ Moderate shortage (3–6 months)

- ☐ Severe shortage (more than 6 months) ☐ Chronic / ongoing shortage

C7. How did your household cope with food shortages after the landslide? (Tick all that apply)

- ☐ Received food aid / NGO relief ☐ Borrowed food from neighbours ☐ Purchased food (depleted savings)
- ☐ Reduced number of meals per day ☐ Migrated temporarily for food ☐ Sold assets (land, animals) to buy food

C8. Rate the impact of landslides on each agricultural indicator below (1 = No impact, 5 = Extreme impact):

Indicator	1	2	3	4	5	Remarks
Overall agricultural productivity	☐	☐	☐	☐	☐	
Soil fertility / quality of farmland	☐	☐	☐	☐	☐	
Availability of food for household consumption	☐	☐	☐	☐	☐	
Income from crop sales / farming	☐	☐	☐	☐	☐	
Livestock numbers and productivity	☐	☐	☐	☐	☐	
Access to farming tools and inputs	☐	☐	☐	☐	☐	

SECTION D: INCOME, LIVELIHOODS AND ECONOMIC IMPACTS

D1. Estimated monthly household income BEFORE the most severe landslide event (UGX):

- ☐ Below 50,000 ☐ 50,001 – 100,000 ☐ 100,001 – 250,000
- ☐ 250,001 – 500,000 ☐ Above 500,000

D2. Estimated monthly household income AFTER / following the landslide (UGX):

- ☐ Below 50,000 ☐ 50,001 – 100,000 ☐ 100,001 – 250,000
- ☐ 250,001 – 500,000 ☐ About the same as before

D3. Approximate total value of property (house, land, animals, crops, tools) lost to landslides (UGX):

- ☐ Less than 500,000 ☐ 500,001 – 1,000,000 ☐ 1,000,001 – 5,000,000
- ☐ 5,000,001 – 10,000,000 ☐ More than 10,000,000

D4. Has your main source of livelihood changed because of landslides?

- ☐ Yes — shifted to casual labour
 ☐ Yes — shifted to petty trade
 ☐ Yes — dependent on relief aid
☐ Yes — other change
 ☐ No — same as before

If yes (other change), specify:

D5. Did your household take on debt (loans, borrowing) to recover from landslide losses?

- ☐ Yes — from family/neighbours
 ☐ Yes — from microfinance/bank
 ☐ Yes — from moneylender
 ☐ No debt taken

D6. Have any household members been forced to migrate for work because of landslide impacts?

- ☐ Yes — within Bududa District
 ☐ Yes — to other districts
 ☐ Yes — to Kampala/urban area
 ☐ No migration occurred

D7. How would you describe your household's economic recovery status TODAY?

- ☐ Fully recovered
 ☐ Mostly recovered (>75%)
 ☐ Partially recovered (25–75%)
☐ Barely recovered (<25%)
 ☐ Not recovered at all

SECTION E: HOUSING AND PHYSICAL INFRASTRUCTURE

E1. What type of house does your household currently live in?

- ☐ Permanent (brick/cement)
 ☐ Semi-permanent (mud/iron sheets)
 ☐ Temporary / makeshift structure
☐ Rented accommodation
 ☐ Living with relatives

E2. Was your house damaged or destroyed by a landslide?

- ☐ No damage
 ☐ Partially damaged — repaired
 ☐ Partially damaged — not repaired
☐ Completely destroyed
 ☐ Buried under debris

E3. Was your household displaced from your home due to a landslide?

- ☐ No, we stayed
 ☐ Yes — temporarily (returned)
 ☐ Yes — permanently relocated
 ☐ Yes — to government resettlement

E4. Which infrastructure in your community was damaged by landslides? (Tick all that apply)

- ☐ Roads / footpaths
 ☐ Bridges
 ☐ Water pipes / springs
 ☐ Electricity lines

- ☐ School buildings
 ☐ Health centre
 ☐ Market / trading centre
 ☐ Irrigation / drainage channels

E5. How long were roads or bridges in your area impassable after the worst landslide?

- ☐ Less than 1 week
 ☐ 1 – 4 weeks
 ☐ 1 – 6 months
☐ 6 – 12 months
 ☐ More than 1 year
 ☐ Never fully repaired

SECTION F: EFFECTS ON EDUCATION AND HEALTH SERVICES

F1. Were any school-going children in your household unable to attend school due to landslides?

- ☐ No — not affected
 ☐ Yes — missed less than 1 month
 ☐ Yes — missed 1–3 months
☐ Yes — missed more than 3 months
 ☐ Yes — dropped out completely

F2. What were the main reasons children missed school? (Tick all that apply)

- ☐ School building damaged/destroyed
 ☐ Roads impassable / unsafe
 ☐ Displaced — moved away
☐ No money for school fees after losses
 ☐ Child needed to help household work
 ☐ Not applicable

F3. Was access to health services affected by landslides in your community?

- ☐ No — access remained normal
 ☐ Yes — health centre was damaged
 ☐ Yes — roads to clinic impassable
☐ Yes — both roads and facility affected
 ☐ Yes — health workers evacuated

F4. Did any household members experience health problems DIRECTLY caused or worsened by landslide conditions?

- ☐ No health issues
 ☐ Injuries from landslide debris
 ☐ Waterborne diseases (cholera, diarrhea)
☐ Respiratory illness (dust)
 ☐ Psychological trauma / stress
 ☐ Malnutrition / food-related illness

F5. Did your household lose any members (death or serious injury) due to landslides?

- ☐ No
 ☐ Yes — one member injured
 ☐ Yes — one member killed
 ☐ Yes — multiple members killed/injured

F6. Have you or any household member received psychosocial support / counselling after a landslide?

- ☐ Yes — from NGO
 ☐ Yes — from health workers
 ☐ Yes — community/religious group
☐ No — no support received
 ☐ Did not feel it was needed

SECTION G: SOCIAL IMPACTS AND COMMUNITY COHESION

G1. How has the landslide affected your household's social relationships and community ties?

- ☐ Strengthened — people helped each other
 ☐ No significant change
 ☐ Weakened — some families left
☐ Severely disrupted — community dispersed
 ☐ Conflicts over land/resources arose

G2. Which social groups in your community were MOST affected by landslides? (Tick up to TWO)

- ☐ Women
 ☐ Children under 15
 ☐ Elderly (60+)
☐ Persons with disabilities
 ☐ Very poor households
 ☐ All equally affected

G3. Did landslide losses cause tension or conflict within your household or with neighbours?

- ☐ No conflict
 ☐ Minor tensions — resolved
 ☐ Land boundary disputes arose
☐ Household conflict due to stress/poverty
 ☐ Community-level conflict

G4. Rate the social impact of landslides on the following (1 = Not affected, 5 = Severely affected):

Indicator	1	2	3	4	5	Remarks
Sense of personal safety and security	☐	☐	☐	☐	☐	
Ability to observe cultural traditions and practices	☐	☐	☐	☐	☐	
Community unity and cooperation	☐	☐	☐	☐	☐	
Trust in government/authorities to protect you	☐	☐	☐	☐	☐	
Children's wellbeing and development	☐	☐	☐	☐	☐	

SECTION H: MITIGATION, GOVERNMENT RESPONSE AND RECOVERY STRATEGIES

H1. What type of assistance did your household receive after a landslide? (Tick all that apply)

- ☐ Food / emergency relief
 ☐ Temporary shelter / tents
 ☐ Cash / financial support
☐ Medical care
 ☐ Agricultural inputs (seeds, tools)
 ☐ No assistance received

H2. Which organizations provided assistance to your household?

- ☐ Government of Uganda / OPM
 ☐ Local government (Bududa District)
 ☐ Red Cross / humanitarian NGOs
☐ Religious organizations
 ☐ Neighbours / community members
 ☐ No assistance

H3. How would you rate the adequacy of the government's response to landslide disasters in your area?

- ☐ Very adequate
 ☐ Adequate
 ☐ Somewhat adequate
☐ Inadequate
 ☐ Very inadequate

H4. Are any of the following landslide mitigation measures practiced in your community? (Tick all that apply)

- ☐ Tree planting / reforestation
 ☐ Terracing / contour farming
 ☐ Drainage channel construction
 ☐ Community early warning system
☐ Government resettlement programme
 ☐ Ban on farming in steep areas
 ☐ Disaster preparedness drills
 ☐ None of the above

H5. How effective do you consider the following mitigation strategies? (1 = Very Ineffective, 5 = Very Effective)

Indicator	1	2	3	4	5	Remarks
Reforestation / tree planting programmes	☐	☐	☐	☐	☐	
Terracing and contour farming	☐	☐	☐	☐	☐	
Community early warning systems	☐	☐	☐	☐	☐	
Government resettlement to safer areas	☐	☐	☐	☐	☐	
Ban / restriction on cultivation in high-risk zones	☐	☐	☐	☐	☐	
Awareness campaigns and community sensitization	☐	☐	☐	☐	☐	

H6. Would you be willing to relocate permanently to a safer area if support were provided?

☐ Yes — willing and ready

☐ Yes — but need financial support

☐ Uncertain — depends on conditions

☐ No — cultural attachment to land

☐ No — prefer to stay despite risk

If No, explain why briefly:

H7. What mitigation strategy do you think would be MOST effective for your community? (Choose ONE)

☐ Enforced resettlement with land

☐ Community-managed early warning system

☐ Integrated reforestation and farming practices

☐ Improved government disaster response funding

☐ Better land-use planning and enforcement

SECTION I: PERCEPTIONS, VULNERABILITY AND FUTURE OUTLOOK

I1. Compared to 10 years ago, do you think the risk of landslides in your area has:

☐ Greatly increased

☐ Slightly increased

☐ Remained the same

☐ Slightly decreased

☐ Greatly decreased

I2. What do you think is the SINGLE MOST IMPORTANT factor making your community more vulnerable to landslides?

☐ Continued deforestation

☐ Climate change / erratic rainfall

☐ Population pressure on land

☐ Poverty (can't afford to move)

☐ Lack of government investment

☐ Other (specify below)

Specify other factor:

I3. Do you believe the frequency and severity of landslides in your area will change over the next 10 years?

☐ Will get much worse

☐ Will get slightly worse

☐ Will stay the same

☐ Will improve with interventions

☐ Don't know

I4. Do you have any indigenous/traditional signs or knowledge that warn you of an upcoming landslide? Please describe:

Traditional signs or knowledge:

15. In your own words, what is the SINGLE BIGGEST socio-economic challenge your household faces as a result of recurring landslides?

Response:

16. What recommendations do you have for the government, NGOs, and researchers to better support landslide-affected communities?

Recommendation 1:

Recommendation 2:

ENUMERATOR DECLARATION

I confirm that this questionnaire was completed with the respondent's informed consent, that all responses were recorded accurately, and that the respondent was informed of their right to withdraw at any time.

Enumerator Signature: _____ Date: _____

Supervisor Review: _____ Date: _____

Thank you for your time and participation.

Wetunga Grace | BU/UP/2023/1770 | Department of Geography | Busitema University

Appendix II: Field Photographs

The plates below present selected field photographs taken during data collection in Nametsi Sub-County, organized according to the three specific objectives of the study.

Objective 1: Physical and Human Causes of Landslides in Nametsi Sub-County



Plate 1: A landslide scarp and erosion channel on a steep hillside, showing exposed soil left by slope failure.

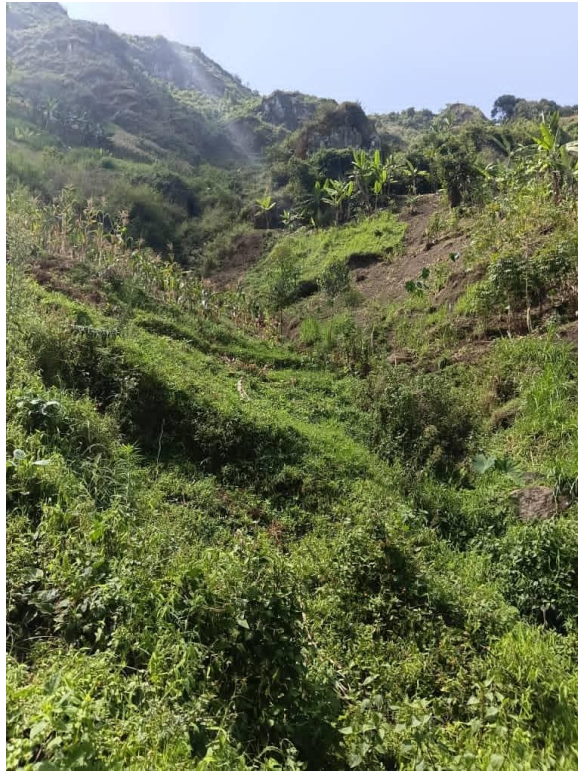


Plate 2: A vegetated landslide scar cutting through a cultivated hillside, illustrating the steep terrain characteristic of the study area.

Objective 2: Socio-Economic Effects of Landslides on Households and Communities



Plate 3: A stagnant, muddy water pool near a settlement path, reflecting the disruption of clean water sources following landslide events.

Objective 3: Mitigation Strategies and Community Responses



Plate 4: A stand of eucalyptus trees planted on a slope as part of community afforestation efforts to stabilize soil and reduce landslide risk.



Plate 5: Mature eucalyptus trees with exposed root systems, illustrating ongoing reforestation as a landslide mitigation strategy in the area.