

BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
SCHOOL OF GEOGRAPHY
DEPARTMENT OF SUSTAINABLE DEVELOPMENT



**FAMERS' LIVED EXPERIENCES OF ELNINO-INDUCED DROUGHT: EVIDENCE
FROM WARD 13 MUZARABANI DISTRICT, MASHONALAND CENTRAL**

BY

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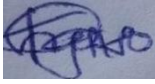
**DISSERTATION SUBMITTED TO BINDURA UNIVERSITY IN PARTIAL
FULFILMENT OF BACHELOR OF SCIENCE HONOURS DEGREE IN
DEVELOPMENT STUDIES**

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JUNE 2025

DECLARATION

I Most L Kakunguwo, B212200B declare that this dissertation is the product of my own work with only exception of the references which have been credited to their sources. The work was not copied from any source without acknowledged of the publisher.

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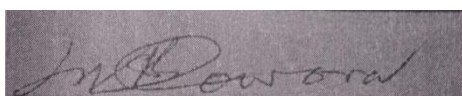
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Approval Form

The undersigned certify that they have supervised the student Most L Kakunguwo's dissertation entitled **Famers' lived experiences of Elnino-induced drought: Evidence from ward 13, Muzarabani District, Mashonaland Central**. Submitted in partial fulfillment of Bachelor of Science Honours Degree in Development Studies.



Supervisor: Dr. P. Mukwenyi



Chairperson: Dr. J. Bowora

DEDICATION

I offer my sincere gratitude and dedication to God for his guidance and protection during this research journey. Special dedication also goes to my parents Tonderai Kakunguwo and Winnet Chadyamunda for inspiring me through my educational career, by providing emotional, spiritual and physical support from the beginning. I also give special dedication to my friends namely Timothy Mwanandimai, Hetani Chimumu, Angela Nyakudya, and Gibson Munangwa and others for their support.

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ABSTRACT

El Niño-induced droughts pose serious threats to rural agricultural livelihoods, disrupting food security and economic stability globally. These climate events disproportionately affect vulnerable communities, necessitating adaptive strategies to mitigate their impact. While studies have explored the broader economic and agricultural consequences of El Niño-induced droughts, limited research examines localized farmer experiences, particularly in Ward 13, Muzarabani District, Zimbabwe. Many studies highlighted more on financial losses and low yields, overlooking the cultural and psychological dimensions of drought impacts. This study utilized qualitative methods, including interviews, focus group discussions, and observations, to gather insights from A1, Medium, and A2 farmers in Ward 13. The approach ensures a comprehensive understanding of farmers' lived experiences, socio-economic effects, and adaptive strategies. Findings revealed that farmers experienced fundamental emotional and financial strain, with adaptation strategies varying by farm size and resources. A2 farmers utilize irrigation systems, while A1 and Medium farmers rely on small dams and mixed farming. Additionally, indigenous knowledge plays a vital role in drought prediction and decision-making, shaping farming strategies. These insights highlighted the need for context-specific interventions, including improved access to adaptive resources and informed policy development. The findings will benefit local policymakers, agricultural extension officers, and community leaders, ensuring tailored support for farmers in drought-prone areas. Addressing gaps in cultural and psychological drought impacts, this study can contribute to resilience-building strategies, fostering sustainable agricultural practices, and promoting long-term food security in affected communities.

LIST OF FIGURES

Figure 2.1. Study Conceptual Framework	12
Figure 3.1 Study Area Map of Ward 13, Muzarabani District (Source: Author)	21
Figure 4.1. Response Rate of Study Participations (Source: Primary data)	31
Figure 4.2 Unutilized Farms and few livestock (Source: Primary Data).....	34
Figure 4.3 Fields with Stunted Crops and Farmers using Scotch carts to Fetch Water (Source: Primary Data).....	36
Figure 4.4. Irrigation System and Small Dams (Source: Primary Data)	37
Figure 4.5 Mixed Farming (Source: Primary Data).....	41
Figure 4.6. Water Tanks and Small Dams (Source: Primary Data).....	42

LIST OF TABLES

Table 4.1 Demographic characteristics of Study Participants (Source: Primary Data).....	32
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TABLE OF CONTENTS

DECLARATION	i
Approval Form.....	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT.....	v
LIST OF FIGURES	vi
LIST OF TABLES.....	vii
ACRONYMS	xii
CHAPTER 1: ORIENTATION OF THE STUDY	1
1.1 Chapter Introduction	1
1.2 Background of the Study	1
1.3 Statement of the Problem.....	3
1.4 Research Objectives	4
1.5 Research Questions	5
1.6 Significance of the Study	5
1.7 Assumptions of the Study	5
1.8 Limitations of the Study.....	6
1.9 Delimitations.....	6
1.10 Definition of key Terms.....	7
1.11 Summary of the Chapter	7
CHAPTER 2: LITERATURE REVIEW	9
2.1 Introduction.....	9
2.2 Understanding El Nino and Climate Variability	9
2.3 Theoretical Framework.....	10
2.4 Conceptual Framework.....	11
2.5 Impacts of El Nino-Induced on Rural Communities.....	12
2.5.1 Agricultural Production and Food Security	13
2.5.2 Socio-economic Impacts	13

2.5.3 Environmental Impacts	14
2.6 FARMERS' LIVED EXPERIENCE OF DROUGHT	15
2.6.1 Perceptions of El Nino and Drought Events	15
2.6.2 Psychosocial Effects	15
2.6.3 Gendered Experiences.....	16
2.7 Coping Mechanisms and Adaptation Strategies	16
2.7.1 Traditional and Indigenous Strategies.....	16
2.7.2 Modern Adaptation Approaches	17
2.7.3 Institutional Support.....	18
2.8 Case Studies and Comparative Research	18
2.9 Knowledge Gaps and Challenges in Literature.....	19
2.10 Summary	19
CHAPTER 3: RESEARCH METHODOLOGY	20
3.1 Introduction.....	20
3.2 Study Area	20
3.3 Research Design.....	21
3.4 Target Population.....	22
3.5 Sampling Procedures	22
3.5.1 Sample Size.....	23
3.5.2 Sampling Techniques.....	24
3.6 Data Collection Instruments.....	24
3.6.1 Piloting the Instruments	26
3.6.2 Validity of the Instruments	26
3.6.3 Reliability of the Instruments.....	27
3.7 Data Collection Procedure	27
3.8 Data Analysis Techniques.....	28
3.9 Ethical Principles	29
3.10 Chapter Summary	30
CHAPTER 4: DATA PRESENTATION, INTERPRETATION, AND DISCUSSION.....	31

4.1 Introduction.....	31
4.2 Response Rate.....	31
4.3 Demographic Characteristics of Participants.....	32
4.4 Famers’ lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.	33
4.4.1 Psychological and Emotional Impact.....	33
4.4.2 Challenges in Farming and Daily Life.....	34
4.4.3 Coping Mechanisms and Adaptive Strategies.....	36
4.5 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District	38
4.5.1 Economic Impacts.....	38
4.5.2 Social Impacts.....	39
4.6 The adaptive strategies employed by farmers in response to El Nino-induced drought.....	40
4.6.1 Crop Choices and Farming Practices	40
4.6.2 Water Management and Infrastructure.....	41
4.6.3 Indigenous Knowledge (IK) for Drought Prediction	42
4.7 Discussion.....	43
4.7.1 Famers’ lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.	43
4.7.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District	44
4.7.3 Adaptive strategies employed by farmers in response to El Nino-induced drought.....	44
4.8 Summary of the Chapter	45
CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	46
5.1 Introduction.....	46
5.2 Summary	46
5.2.1 Famers’ lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.	46
5.2.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District	46

5.2.3 The adaptive strategies employed by farmers in response to El Nino-induced drought	47
5.3 Conclusions	47
5.3.1 Famers’ lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.	47
5.3.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District	48
5.3.3 The adaptive strategies employed by farmers in response to El Nino-induced drought	48
5.4 Recommendations	48
5.5 Further Research Implications	49
REFERENCES	50
APPENDICES	59
APPENDIX 1: INTERVIEW GUIDE	59
APPENDIX 2: OBSERVATION GUIDE	62
APPENDIX 3: FOCUS GROUP DISCUSSION (FGD) GUIDE	63
APPENDIX 4: Approval Letter from Bindura University of Science Education	66
APPENDIX 5: Approval Letter form Office of the President and Cabinet	67
APPENDIX 6: Plagiarism Report	68

ACRONYMS

CERF.....	Central Emergency Response Fund
SADC.....	Southern Africa Development Community
FAO.....	Food and Agriculture Organization
WFP.....	World Food Programme
FGD.....	Focus Group Discussion
IK.....	Indigenous Knowledge
NGOs.....	Non-Governmental Organizations

CHAPTER 1: ORIENTATION OF THE STUDY

1.1 Chapter Introduction

Droughts pose a significant obstacle to development in low-income nations, particularly in Africa. This study investigates the experiences of farmers in Ward 13, Muzarabani District, Zimbabwe, who have been severely impacted by droughts linked to El Nino. The adverse effects of these droughts have had a lasting influence on the livelihoods of farmers, compelling them to create strategies for coping and surviving in these challenging conditions. This research delved into the real experiences of these farmers by examining their approaches to reducing the impacts of drought. The study offered valuable perspectives on the complexities of adjusting to climate change and enhancing resilience. This chapter established the foundation for the following sections by detailing the background, problem statement, research questions, objectives, significance of the study, assumptions, limitations, delimitations, and definitions of key terms. It concluded with a recap of the chapter to improve comprehension of the study's basis. The experiences of farmers in Ward 13, Muzarabani District, added to the existing knowledge of adapting to climate change and resilience, ultimately guiding policies, initiatives, and programs aimed at assisting farmers facing droughts induced by El Nino.

1.2 Background of the Study

According to Rawat et al. (2024), climate change is defined as a fundamental long-term changes in the global climate, including shifts in temperature, rainfall patterns and the frequency of severe weather events. El Nino is a climate phenomenon branded by the warming of sea surface temperatures in the central and eastern Pacific Ocean, leading to significant changes in weather patterns worldwide (Cai et al., 2021). It often results in severe droughts, particularly in regions like Africa, where its impacts can be devastating on agriculture and livelihoods.

Climate change is a pressing universal matter that negatively affects agricultural activities and livelihoods. El Nino-induced drought has become more frequent and severe, affecting millions of people worldwide (Gosh et al., 2024). Globally, organizations like the United Nations and the Central Emergency Response Fund (CERF) have taken proactive measures to address El Nino-induced drought (Bites, 2016). For example, CERF allocated funds to countries like Somalia, Madagascar, Zimbabwe, and Ethiopia to support early action and rapid response to El Nino-induced drought. According to Sousa Junior (2016), countries such as Australia and

Brazil have implemented various approaches to alleviate the effects of drought on agriculture. For instance, Australia has implemented the National Drought Agreement, which provides financial assistance to farmers and invests in drought resilience programs. Brazil has implemented the National Drought Policy and National Water Law, focusing on water resources management and drought tolerant crops (Sousa Junior, 2016).

In Africa, El Nino-induced drought has severe impacts on agricultural activities, leading to significant food security challenges. Africa is greatly exposed to climate shocks, with droughts estimated to rise extremely and frequently due to El Nino events (Gizaw and Gan, 2017). According to SADC (2024), The Southern Africa Development Community (SADC) launched a US\$5.5 billion Regional Humanitarian Appeal to upkeep individuals who were affected by El Nino-induced drought and floods. This appeal aims to augment domestic resources and mobilize support from national, regional and international partners (SADC, 2024). Countries like South Africa, Kenya and Ethiopia have implemented strategies to overcome droughts caused by El Nino. South Africa has implemented the National Drought Management Strategy, focusing on water conservation, drought tolerant crops and early warning systems (Sifundza et al., 2019). According to Ndengwa and Kinyua (2018), Kenya has founded the National Drought Management Authority, which coordinates drought response efforts and provides support to affected communities.

In Zimbabwe, agriculture is the backbone of the economy and a crucial source of income for many rural communities. As noted by Makanda et al. (2024), persistent challenges like recurring droughts resulting from El Niño, economic hardships, and limited access to resources have adversely affected the socio-economic landscape in Zimbabwe. The Muzarabani District, located in the Mashonaland Central Province, exemplifies this reliance on agriculture, with a significant portion of the population engaged in farming. These difficulties have increased the vulnerability of the local communities, especially those dependent on rain-fed farming, such as the residents of Ward 13.

Several studies have recognized the effects of El Nino-induced in Zimbabwe. For instance, the Food and Agriculture Organization of the United Nations (2016) highlighted the severe droughts during the 2015-2016 El Niño event, which led to widespread crop failure and livestock losses. The United Nations Office for the Coordination of Humanitarian Affairs (2024) reported on the 2023/2024 El Niño event, emphasizing the need for anticipatory action

and early warning systems to mitigate its effects. These studies underscore the importance of resilience building measures and target interventions to support vulnerable communities.

While important researches have focused on the aggregate national and provincial levels, providing valuable insights into the effects of El Nino on crop yields, livestock productivity and food availability, there is also noticeable gap in understanding the personal, social and emotional dimensions of farmers' experiences with El Nino-induced drought in rural areas. Specifically, limited studies have been conducted in Muzarabani District, an area highly vulnerable to droughts. This study addressed these gaps by examining the lived experiences of farmers in Ward 13, Muzarabani District. This research informed evidence based interventions that enhance the resilience of farmers in the face of climate shocks. Understanding the coping mechanisms and strategies employed by farmers to adapt to El Nino-induced drought, helped this research to contribute to the development of more holistic and effective drought mitigation strategies and the findings helped policymakers and stakeholders to design tailored interventions that address the distinctive encounters faced by farmers in Muzarabani District.

1.3 Statement of the Problem

Recent researches have significantly advanced the understanding of how El Nino-induced drought affect agricultural productivity and food security in Zimbabwe. For instance, Mugiyi and Chikwari (2023) examine the influence of El Nino on agriculture in Southern Africa, proposing strategies for proactive response to mitigate its impacts. Another study by Moyo et al. (2024) looks into the socio-economic consequences of droughts on smallholder farmers, emphasizing the need for adaptive measures to boost resilience. These studies mainly concentrate on big national and provincial levels, highlighting the considerable effects of drought on crop yields, livestock productivity and overall food availability.

In an ideal scenario, agricultural communities like those in Muzarabani District would possess the resilience needed to cope with climate challenges such as El Nino-induced drought. Farmers would have access to essential resources such as boreholes and small dams and standard irrigation systems to support their agricultural activities. These communities benefit from better communication channels for early warning systems, providing timely and accurate information to help farmers prepare for El Nino. To add on, access to financial assistance and support from local authorities play a crucial part in alleviating the impacts of El Nino-induced drought. In this scenario, food security was ensured and farmers' livelihoods were stable and sustainable, contributing to the community's overall well-being.

Despite the significant contributions of these recent researches, there was remaining critical gap in understanding the lived experiences of farmers in specific locations like Ward 13, Muzarabani District. Most studies focus on broader national and provincial levels, shedding light on the significant effects of drought on crop yields, livestock productivity and overall food availability. However, these studies often neglect the personal, social and cultural dimensions of farmers' experiences with El Nino-induced drought. This lack of detailed, localized research impedes the improvement of targeted and operative drought mitigation strategies that address the unique challenges faced by farmers in these areas.

If this issue remains unresolved, farmers in Ward 13, Muzarabani District, will continue to face these daily challenges. The absence or failing to understand their personal, social and cultural experiences will hinder the development of effective interventions. Therefore, these communities will remain vulnerable to the adverse effects of El Nino-induced drought, leading to ongoing food insecurity, economic instability and diminished well-being. Moreover, the lack of tailored support measures may exacerbate farmers' emotional and social struggles, negatively impacting their relationships, mental health and overall quality life.

This research aimed to bridge this critical gap, by conducting a comprehensive examination of the lived experiences of farmers in Ward 13, Muzarabani District. This study examined the personal, social, and cultural challenges and strengths of farmers facing El Nino-induced drought. Digging deeper into the emotional, social and cultural dimensions of farmers' experiences, helped this research to provide an enhanced understanding of how droughts impact their relationships, well-being and sense of identity. The findings informed the development of context-specific strategies that enhance the resilience and well-being of farmers, contributing to more effective drought mitigation and adaptation strategies.

1.4 Research Objectives

1. To understand famers' lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.
2. To analyze the socio-economic impacts of El Nino-induced drought of farmers in Ward 13, Muzarabani District.
3. To explore the adaptive strategies employed by farmers in response to El Nino-induced drought.

1.5 Research Questions

1. How do farmers perceive and describe their lived experiences during El Nino-induced drought and what insights can be drawn from their narratives?
2. What are the socio-economic impacts on El Nino-induced drought on farming activities, income levels and community well-being in Ward 13, Muzarabani District?
3. What adaptive strategies do farmers use to mitigate the effectiveness of El Nino-induced drought and how effective are these strategies?

1.6 Significance of the Study

The research on lived experiences and adaptation strategies of farmers in Ward 13, Muzarabani District, regarding El Nino-induced drought is important as it provides significant insights into how drought affect farmers' livelihoods and identifies effective strategies for adaptation. The findings will benefit a range of stakeholders such as farmers, policymakers, agricultural extension workers, researchers, local communities, local government officials, NGOs, the student and Bindura University of Science Education. Farmers in Ward 13 and similar areas will gain a deeper understanding of their experiences and adaptation strategies, empowering them to enhance their resilience and agricultural productivity. Policymakers will receive evidence based data on the impacts of drought and effectiveness of current adaptation strategies, informing the development of targeted and effective policies and interventions. Agricultural extension agents will acquire knowledge to better assist farmers. Researchers will find valuable information for future studies on climate change adaptation and resilience. The local communities will benefit from increased awareness of El Nino impacts and the importance of adaptation strategies, fostering community resilience and collective action. Local government officials will use the study's insights for informed decision making and planning. NGOs will obtain crucial information for designing effective programs and support services. The student gained practical experience, enhancing skills and knowledge in climate change adaptation. Finally, the study will enhance Bindura University's research profile, informing academic programs and fostering community engagement.

1.7 Assumptions of the Study

This research operates on several key assumptions, farmers in Ward 13 and similar regions are facing the effects of El Nino-induced drought and actively seeking ways to improve their resilience. It is assumed that the current adaptation methods are insufficient to fully mitigate the impact of these droughts. There is a recognized need for detailed, evidence-based

information regarding the effects of droughts on farmers' livelihoods and the effectiveness of the existing adaptation strategies. It is expected that the research's outcomes can be used to other areas with similar climatic conditions. The research participants are presumed to share honest and accurate information, with data collection methods being effective in gathering necessary details. Additionally, it is assumed that farmers have access to sufficient resources and information to participate in the study and that external factors like government policies and market conditions remain relatively stable during the study. The sample of farmers is expected to be representative of the larger community in Ward 13 and similar regions, with respect for cultural contexts and local customs maintained throughout the research. Furthermore, it is assumed that relevant stakeholders will be willing to engage with the study and its results. Lastly, the research's outcomes will be disseminated to key stakeholders and researchers, with the expectation that the recommendations will be implemented. By acknowledging these assumptions, the study aims to create a transparent and solid foundation for the research, ensuring that the findings are interpreted accurately and meaningfully.

1.8 Limitations of the Study

The research acknowledged certain constraints and boundaries that affected the scope, validity and applicability of the findings. Geographically, the research was limited to Ward 13 and similar regions, which was not representative of other areas experiencing El Nino-induced drought, potentially affecting the generalizability of the findings. To address this, the researcher carefully selected a representative sampling frame and employed several research instruments such as interview guide, focus group discussion guide, and observation checklist to triangulate data from multiple sources. The characteristics of farmers was also a challenges, Ward 13 is characterised with three different farms sizes. There are A1 which are the smallest (5-6 hectares), followed by Medium farms (20 hectares), and A2 farms (90-120 hectares). It was challenging to collect data from several huge farms. However, the scholar utilized purposive and convenience sampling techniques to reach to farmers. Acknowledging and addressing these limitations, the researcher has taken steps to minimize their impact, warranting the reliability and validity of the outcomes.

1.9 Delimitations

The research focused on farmers' lived experiences of El Nino-induced drought in Ward 13, Muzarabani District, Mashonaland Central, Zimbabwe, characterized by a mix of hilly and flat terrain. The economic activities include subsistence farming, commercial farming, small scale

trading and artisanal mining, while the economic status of the area is fragile and vulnerable. The research examined farmers' experiences and perceptions of El Nino-induced drought, their impact on agricultural practices and productivity and coping strategies and resilience, within the timeframe of 2015/16 and to date. It excluded other type of disasters, non-agricultural impacts of drought and areas outside Ward 13 and Muzarabani District. The delimitations clarified the research's scope and boundaries, ensuring a focused and feasible study that inform targeted intervention and policies to support farmers' resilience and well-being, contributing to sustainable development in vulnerable communities.

1.10 Definition of key Terms

Defining important words is essential in research to ensure clarity, precision, and consistency in communication. In this study, three critical terms require definition to facilitate a comprehensive understanding of the research topic are Farmers' Lived Experiences, El Nino-induced Drought and Farmers' Resilience. El Nino-induced Drought refer to the abnormal drying of the land and water scarcity caused by El Nino phenomenon (National Oceanic and Atmospheric Administration, 2023). Lived Experiences refer to the means in which individuals experience and interpret their world, including their perceptions, feelings, and actions (U.S. Department of Health and Human Services, 2022). Food and Agriculture Organization of the United Nations (2021) posits that, Farmers' Resilience is the capacity to absorb and recover from shocks, such as droughts, while maintaining their agricultural productivity and livelihood.

1.11 Summary of the Chapter

The chapter laid the groundwork for a comprehensive study on farmers' lived experiences of El Nino-induced droughts in Ward 13, Muzarabani District. By introducing the research topic and providing a detailed background of the research, the chapter establishes the context and significance of the study. The statement of the problem and study questions then sharpen the focus of the investigation, highlighting the need to understand farmers' experiences and resilience strategies in the face of droughts. The study objectives and significance of the research clarify the purpose and potential impacts of the research, while the assumptions, limitations and delimitations provide a transparent and rigorous framework for the investigation. Finally, the definition of key terms ensures clarity and precision in the research. This chapter creates a solid foundation for the subsequent chapters to explore the research methodology, literature review, and data analysis, ultimately, shedding light on the complex

experiences of farmers in the district. This chapter sets the stage for an in-depth exploration of farmers' lived experiences and resilience strategies in the face of El Niño-induced droughts.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature review aims to provide a better understanding of the existing research related to El Nino-induced drought, their impacts on agriculture and lived experiences and adaptation strategies of farmers. It synthesizes findings from various studies, identifies gaps in the current knowledge and establishes a framework for the present research. The scope of the review encompasses understanding the El Nino phenomenon and its mechanisms leading to drought conditions, assessing the impacts of El Nino-induced drought on agricultural productivity, food security and farmers' livelihoods and exploring how farmers perceive and cope with these challenges, including their adaptive strategies and resilience. The key guiding questions for this review include: what are the key characteristics and mechanisms of El Nino phenomenon, and how do they contribute to drought conditions? And other research question stated in chapter one.

2.2 Understanding El Nino and Climate Variability

According to Behera et al. (2021), El Nino, an intricate wonder, is defined by the intermittent warming of sea surface temperatures in the central and eastern equatorial Pacific Ocean. This warming disturbs ordinary weather patterns, leading to significant climatic variability across the globe. El Nino occasions are described by a reversal of trade winds, a shift in the Walker Circulation and an increase in oceanic and atmospheric temperatures in the Pacific region (Behera et al., 2021). Globally, El Nino events have far reaching impacts, influencing weather patterns and temperatures. These impacts manifest as droughts, floods and severe weather conditions in various areas of the world (National Oceanic Atmospheric Administration, 2023). According to United Nations Office for the Coordination of Humanitarian Affairs (2023), regions such as Australia, South Asia and the southern United States often experience severe droughts, while areas like the western coast of South America face heavy rainfall and flooding. The economic consequences of El Nino are substantial, affecting agriculture, fisheries, water resources and overall economic stability.

Regionally in Sub-Saharan Africa, El Nino events are closely related to drought conditions. The warming of the Pacific Ocean alters the atmospheric circulation patterns, leading to a decrease in rainfall and prolonged dry spells in many parts of Sub-Saharan Africa (Gizaw and Gan, 2017). These droughts have a profound impact on agricultural productivity, food security and livelihoods, particularly in regions heavily depend on rain-fed agriculture. Countries like

Zimbabwe, where agriculture is a primary source of livelihood, experience significant challenges due to reduced availability of water for crops and livestock during El Nino events. Understanding the relationship between El Nino and drought in Sub-Saharan Africa is vital for creating effective adaptation and mitigation strategies. This linkage highlights the need for comprehensive early warning systems, improved water management practices and resilient agriculture techniques to help communities withstand the adverse effects of El Nino-induced drought.

2.3 Theoretical Framework

This study employed the Climate Change Adaption Framework. The Climate Change Adaptation Framework address how communities, systems and sectors adapt to the effects of climate shocks by developing and implementing strategies, policies and practices that enhances resilience (United Nations Development Programme, 2023). This includes creating changes in social, economic, and environmental practices to ease exposure and increase the capacity to cope with and recover from climate-related shocks. This framework emphasizes practical and actionable strategies that address the multi-dimensional aspects of adaptation (World Bank, 2020). To support the Climate Change Adaptation Framework, the study applied the Livelihoods Approach. The Livelihoods Approach focuses on understanding the factors influencing people's ability to secure a living and maintain their well-being (Natarajan et al., 2022). It emphasizes the assets, abilities, and actions that individuals and communities use to sustain their livelihoods, considering diverse resources (natural, financial, human, social, and physical) and external factors that impact livelihoods (Scoones, 2015). This approach is dynamic and context-specific, highlighting the interplay between resources, institutions and livelihood strategies. In agriculture, the Livelihoods Approach helps analyze how farmers adapt to climatic challenges and sustain their livelihoods.

Several studies have utilized the Climate Change Adaptation Framework and the Livelihoods Approach. For example, Smit and Wandel (2006) applied the Climate Change Adaptation Framework to analyze community-based adaptation strategies in rural areas, emphasizing local knowledge and institutions' roles. Similarly, Ellis (2000) applied the Livelihoods Approach to analyze rural livelihood diversification in developing countries, highlighting multiple income sources and resources access. Strengths of the Climate Change Adaptation Framework include its comprehensive approach to understand the multi-dimensional aspects of adaptation, its focus on practical, actionable strategies and its applicability to various contexts. The Livelihoods Approach adds to these strengths with its holistic perspective that considers a wide

range of factors influencing livelihoods and its emphasis on the dynamic and context-specific nature of livelihood strategies (Tohidimoghadam et al., 2023). Tohidimoghadam et al. (2023), further stated limitations which include challenges in implementing adaptation strategies due to resource constraints, political will and socio-cultural barriers, and measuring the usefulness of adaptation approaches and the diverse resources and capabilities considered in the Livelihoods Approach can be complex and require extensive data collection and analysis, making it resource intensive.

The Climate Change Adaptation Framework, supported by the Livelihoods Approach, shaped this study by providing a lens to examine how farmers in Ward 13, Muzarabani District, adapt to El Niño-induced drought. It guided the analysis of farmers' adaptive strategies, the effectiveness of these strategies, and the factors influencing their ability to cope with climatic changes. Focusing on adaptation and livelihoods, the study identified practical, context-specific measures that enhanced farmers' resilience to drought. The Livelihoods Approach helped examine farmers' access to and utilization of various resources, their capabilities, and the external factors influencing their adaptation strategies. Despite its limitations, the Climate Change Adaptation Framework, supported by the Livelihoods Approach, was utilized because it offers a better and more practical way to understand farmers' responses to climatic challenges. The framework's emphasis on actionable strategies supports the research's objectives to examine farmers' lived experiences and adaptation methods. Additionally, the holistic perspective of both frameworks enables the integration of social, economic, and environmental factors, providing a better understanding of adaptation and livelihoods in the context of El Niño-induced drought. Grounding this study in the Climate Change Adaptation Framework, supported by the Livelihoods Approach, facilitated a comprehensive understanding of the complexities of farmers' adaptation processes and developed targeted interventions to support their resilience and well-being.

2.4 Conceptual Framework

The conceptual framework of this research provided a visual and theoretical representation of key variable and their relationships in understanding how farmers in Ward 13, Muzarabani District, adapt to El Nino-induced drought. It focused on the multifaceted aspects of adaptation and resilience in the agriculture context.

The components included climate change alteration approaches which refers to measures and practices to cope with and mitigate climate change effects. Examples are crop diversification,

water conservation techniques, drought resistant crop varieties and community based resource management (United Nations Development Programme, 2023). Livelihood resources and capitals encompass various assets individuals and communities used to sustain their livelihoods. These include natural, financial, human, social and physical capital such as right to use land and water, financial savings, education and skills, social networks and infrastructure (Ellis, 2000). United Nations Framework Convention on Climate Change (2018) posits that, the vulnerable context refers to external factors and conditions influencing susceptibility to climate related stresses and shocks such as climate variability, economic instability political factors and social dynamics. According to Brooks and Adger (2006) as cited by Lim et al (Eds.), adaptive capacity refers to the capacity to modify practices, resources and behaviors in response to changing climatic conditions and mitigate potential damages. This includes access to data and technology, financial resources, institutional support and community cohesion. According to Donatti et al. (2020), outcomes and well-being refer to the results of adaptation strategies and the overall quality of life. Examples include improved agricultural productivity, enhanced food security, increased income and resilience to climate change effects.

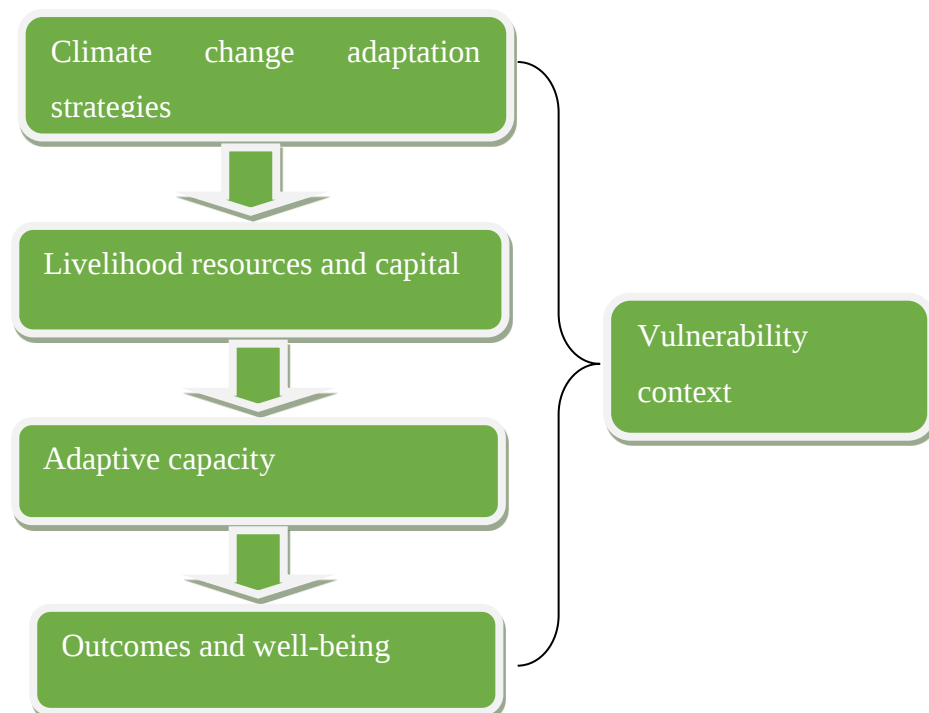


Figure 2.1. Study Conceptual Framework

2.5 Impacts of El Nino-Induced on Rural Communities

This section is going to examine major effects of El Nino-induced drought on rural communities such as agricultural production and food production, socio-economic impacts, and environmental impacts.

2.5.1 Agricultural Production and Food Security

El Nino-induced drought has severe impacts on agricultural production and food security in rural communities. One of the primary effects is the reduction in crop yields and livestock production. El Nino event causes abnormal land drying and water scarcity which lead to adverse conditions for crop growth and livestock health. In Zimbabwe during the 2023-2024 El Nino event many rural areas experienced severe drought conditions, leading to significant reduction in maize production (United Nations Office for the Coordination of Humanitarian Affairs, 2023). The drought resulted in partial or complete crop failure in many regions, with some areas reporting up to 60% of crops being written off and this had a devastating effect on food security and livestock production was also severely affected (United Nations Office for the Coordination of Humanitarian Affairs, 2023). In regions like Matabeleland, farmers faced challenges in providing adequate water and forage for their animals, leading to decreased livestock health and productivity.

In reaction to the problems posed by El Nino, farmers adjust their farming practices. Growing of drought tolerate crops, implementation of water conservation techniques like rainwater harvesting and efficient irrigation methods and crop variation are some of common methods farmers used to reduce the risk of complete crop failure (Mugiyi et al., 2023). These changes in farming practices are vital for maintaining agricultural productivity and food availability in the face of El Nino-induced drought. However, they also require access to resources, information and support from local institutions and government.

2.5.2 Socio-economic Impacts

El Nino-induced droughts have far-reaching socio-economic impacts on rural communities like in Malawi, leading to substantial economic losses and increased poverty levels. These droughts disrupt agricultural production, which is the primary source of earning and employment for many rural households (United Nations in Malawi, 2024). The reduction in crop and livestock production directly translates to decreased agricultural income, affecting farmers' ability to support their families. In Zimbabwe, the economic losses from El Nino-induced drought are evident in several rural communities. For example, the 2015-2016 El Nino event caused agricultural losses, with an estimated 2.5 million people requiring food aid due to crop failures and reduced livestock production (Ainembabazi et al, 2018). This loss forced many households to sell their assets like livestock and farming equipment at lower prices to meet their basic needs, further exacerbating their economic vulnerability. Increased poverty levels are another

critical impact of El Nino-induced drought. As agricultural income decline, rural households struggle to afford essential goods and services, hence food insecurity, malnutrition and reduced access to education and healthcare. In areas like Muzarabani District, where people practice agriculture most, the effects of droughts are severe. Families often reduce food intake and prioritize basic survival needs, leading to long term negative consequences on health and development.

Socio-economic impacts also contribute to social inequalities, as vulnerable people, such as smallholder farmers, women and children are disproportionately affected. Women, who play a vital role in household food production and water management, face increased burdens during droughts, including longer distances to fetch water and reduced opportunities for income generation activities (Matunhu et al, 2022). To mitigate these socio-economic impacts, it is important to create and implement targeted strategies that enhance resilience of rural communities. These interventions may include providing financial support, improving access to drought resistant crop varieties and water saving technologies and strengthening social safety nets. Addressing these socio-economic impacts posed by El Nino-induced drought, the welfare and sustainable development of rural communities around the world can be protected.

2.5.3 Environmental Impacts

According to World Resources Institute (2024), El Nino-induced drought leads to significant environmental impacts, including the degradation of natural resources. Prolonged drought conditions reduce soil moisture, leading to soil compaction and erosion, which decreases soil fertility. A study by Mundenga (2023) mentioned that, In Zimbabwe, regions such as Muzarabani District face challenges in maintaining soil fertility due to nutrient depletion and reduced organic matter. Water sources are also severely affected, with key water bodies like Lake Kariba experiencing decreased water levels, impacting irrigation and drinking water supplies. Changes in biodiversity and ecosystems are also notable (Zambezi River Authority, 2025). Drought conditions alter natural habitat, leading to shifts in species composition and distribution. In Zimbabwe's savanna regions, certain drought tolerant grass species become dominant, impacting the grazing patterns of herbivores and the predators that depend on them (Gusha and Mugabe, 2013). Understanding the environmental impacts of El Nino-induced drought, strategies to mitigate these effects and encourage the sustainable utilization of natural resources can be developed. This can include implementing soil conservation practices, improving water management systems and protecting biodiversity through conservation efforts and habitat restoration.

2.6 FARMERS' LIVED EXPERIENCE OF DROUGHT

This section is going to shed light on the experiences of farmers with drought, understanding farmers' perceptions on El Nino and drought, gender experiences and psychosocial effects of El Nino-induced drought.

2.6.1 Perceptions of El Nino and Drought Events

Farmers' interpretations and understanding of El Nino related droughts are shaped by their direct experiences and observations of climatic changes. United Nations Office for the Coordination of Humanitarian Affairs (2024) argues that, in Zimbabwe, many farmers recognize El Nino as a phenomenon associated with prolonged dry spells and reduced rainfall, significantly impacting their agricultural activities. These droughts are seen as disruptive events that alter farming cycles, threaten crop yields and reduce livestock productivity, thereby endangering food security. Cultural interpretations also influence farmers' responses. For instance, in the Shona culture, the rainmaking ceremony "Mukwerera" involves traditional leaders and spirit mediums performing rituals to invoke rain (Zvingowanisei and Chirongoma, 2024). Similarly, the Ndebele community conducts rituals at sacred sites like mountains and rivers during droughts, seeking divine intervention for rain, these practices reflect the deep cultural connection between the community and their environment (Zvingowanisei, 2024). Exploring farmers' perceptions and local knowledge, a deeper understanding can be gained of socio-cultural dimension of climate adaptation and develop more culturally sensitive and effective interventions to support their resilience and livelihoods.

2.6.2 Psychosocial Effects

Many countries depend on farming, so land is life, only farmers understand this better, drying of water bodies, reduction of livestock and low yields as results of El Nino events creates more fear, stress and anxiety to farmers (CARE Philippines, 2024). Some farmers may be affected by stress because during farming seasons they get loans from different organization for buying inputs and other things, so if drought occurs it will be difficult to find money to pay back (Wilk et al., 2013). Farmers employ various coping mechanisms to deal with these psychosocial challenges. Some turn to religious practices and spiritual beliefs for comfort and hope. Others engage in community activities and seek social support from family and friends to alleviate their stress. Many farmers adapt by altering their farming practices, such as diversifying their crops or investing in water conservation techniques as ways to alleviate the impacts of El Nino-induced drought and reduce their anxiety. In rural communities, strong social bonds and

support systems provide emotional and practical assistance to those affected by drought. Community members often come together share ideas, resources and labor, helping each other to cope with drought. For example, in the Matabeleland region, rural communities have come together to support each other during El Nino-induced drought by establishing the Livestock Support Initiatives (Amalima, 2015). Understanding the psychosocial effects of drought and the importance of community support, it will be easy to develop interventions that foster social cohesion and provide mental health support to farmers.

2.6.3 Gendered Experiences

El Nino-induced drought has different effects on men, women and children in rural households, highlighting gender-specific vulnerabilities and roles. Women are accountable for household food production, water collection and childcare, bear the brunt of the drought's effects (Karuma, 2023). The scarcity of water and reduced agricultural productivity increase their workload, as they travel long distances to fetch water and work harder to secure food for the family. Children, especially girls are also affected as they may be required to assist with household chores, potentially disrupting their education. Men are involved in income generating activities such as farming and livestock productivity. These losses can lead to increased stress and anxiety, as men struggle to provide for their families and maintain their livelihoods (Goh, 2012). The drought's impact on men's traditional roles as providers can also affect their mental health and well-being. Women adopt various coping strategies to manage scarce resources and support their families. For example, women often engage in income generating activities such as selling crafts, vegetables or small livestock to supplement household income (Goh, 2012). They also use traditional knowledge to identify alternative food sources. Understanding the gendered experiences of drought is essential for developing target interventions that address the specific needs and capacities of men, women and children.

2.7 Coping Mechanisms and Adaptation Strategies

In this section different mechanisms and adaptation strategies are going to be discussed, on how they help farmers to face the severe impacts of El Nino-induced drought. They include traditional and indigenous strategies, modern adaptation approaches and institutional support.

2.7.1 Traditional and Indigenous Strategies

David et al. (2020) posits that, traditional and indigenous strategies play a pivotal role in helping rural communities predict and respond to drought conditions. These strategies are rooted in the extensive local knowledge and experiences of generations, which provide

valuable insights into managing climatic challenges. Farmers in many rural communities use traditional knowledge to forecast and prepare for droughts. Observing natural indicators such as animal behavior, plant phenology and atmospheric changes are common practices (David et al., 2020). For example, in Zimbabwe, farmers might interpret the early flowering of certain trees such as the Musasa tree (*Brachystegia spiciformis*) as a sign of an impending dry season and they also notice unusual animal behaviors like the early migration of birds, are often taken as warnings of a potential drought (Murata, 2018). This knowledge allows communities to take precautionary measures such as conserving water, preparing food reserves and adjusting planting schedules to mitigate the impacts of droughts.

Mavesere and Dzawanda (2023) argued that, there are indigenous farming practices that offer practical solutions for mitigating effects of El Nino-induced drought, examples include the Zero tillage also known as the Zai pits, a technique widely used in Southern Africa, including Zimbabwe and in Zimbabwe is now called Pfumvudza. Farmers dig small pits and fill them with organic matter like manure, during rainfall these pits capture and store water, allowing crops to thrive even in dry conditions. Mulching is another example where farmers cover the soil with organic matter like crop residue and leaves to capture moisture, reduce evaporation and improve soil structure (Mugiyo et al., 2023). Additionally, crop rotation and intercropping is another method practiced by farmers. Planting different crops that have different water requirements and growth cycles reduces the total crop failure during drought (Mugiyo et al., 2023). For example, planting drought tolerant crops like millet and sorghum alongside other crops ensures that some harvest is secured. These traditional and indigenous strategies are essential for enhancing the resilience of rural communities to El Nino-induced drought.

2.7.2 Modern Adaptation Approaches

Modern adaptation approaches enhance the resilience of rural communities to El Nino-induced drought through the adoption of climate-resilient crops and technologies, as well as advanced agricultural practices (Semoko, 2024). Farmers are increasingly using climate-resilient crops that can withstand drought conditions such as maize varieties that can grow on a short period of time, sorghum and millet. Precision agriculture technologies like sensors and data analytics help optimize water and nutrient use ensuring efficient resource management. Irrigation systems such as drip and sprinkler irrigation provide consistent water supply during dry periods, minimizing water wastage (Semoko, 2024). Water harvesting methods like small dams and rainwater tanks, capture and store rainwater for agricultural use. According to Lin et al. (2015), agroforestry integrates trees and shrubs into farming systems, offering benefits like

shade, soil erosion reduction and improved soil fertility through leaf litter and nitrogen fixation. These modern approaches, combined with traditional and indigenous strategies create a robust framework for enhancing resilience to El Nino-induced drought.

2.7.3 Institutional Support

Governmental policies and programs are important in supporting farmers during El Nino-induced drought. In Zimbabwe, the government has implemented various initiatives to enhance drought resilience. These include subsidies for drought resistant seeds and fertilizers, promoting irrigation schemes and providing training on water conservation techniques (Matunhu et al., 2022). Recently the government of Zimbabwe is supporting farmers who are practicing the Pfumvudza farming practices with inputs like seeds and fertilizers (Tanyanyiwa et al., 2022). Non-governmental organization (NGOs) and international organizations are vital in building drought resilience in rural communities. For example, organization like the Food and Agriculture Organization (FAO) and World Food Programme (WFP) provide technical support and resources to farmers. They implement projects focused on sustainable agriculture, water management and food security (Food and Agriculture Organization of the United Nations, 2025; World Food Programme, 2025). These institutional supports are essential for promoting the adaptive capacity of farmers and ensuring their resilience to El Nino-induced drought.

2.8 Case Studies and Comparative Research

El Nino-induced droughts have severe impacts across many communities, as illustrated by several studies. A study called “Assessing El Nino-induced drought in Zambia and its effects using earth observation data,” conducted by Ghosh et al. (2024), focuses on the extensive effects of El Nino on agricultural productivity in Zambia, revealing severe food and water shortages. Another study, called “Zimbabwe’s El Nino-induced Drought: Strategies and Measures for Mitigation and Resilience Building,” by the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (2024), examines the strategies and measures implemented to alleviate the impacts of El Nino-induced droughts in Zimbabwe. This research discusses various agricultural interventions, including the use of Pfumvudza farming technique. To enhance resilience and ensure food security. To add on, a study titled “Impacts of El Nino-induced Drought in Zimbabwe,” done by Guthiga et al. (2024), highlights the severe effects of El Nino on maize production, leading to food insecurity and economic instability. These studies brought out themes such as food insecurity, water scarcity and economic instability, underscoring the widespread impact of El Nino-induced droughts on rural

communities. However, there are notable differences in how these impacts manifest in different regions, emphasizing the need for context-specific adaptation strategies. These outcomes collectively underscore the urgent need for mitigation measures and targeted interventions to address challenges posed by El Nino events.

2.9 Knowledge Gaps and Challenges in Literature

Despite many significant studies on drought and climate change. Most researches on El Nino-induced drought focuses on large-scale impacts and broad regional analyses. However, there is limited number of studies that delve into localized farmer experiences, particularly in rural areas like Ward 13, Muzarabani District. Understanding these localized experiences is crucial for developing tailored interventions to address specific vulnerabilities and needs. Many studies on drought impacts primarily emphasize economic and agricultural aspects leaving the cultural and psychosocial dimensions. These dimensions include stress, anxiety and cultural interpretations of drought, which significantly influence how communities perceive and cope with climatic challenges. More research is needed to explore these aspects to develop comprehensive adaptation strategies that consider the well-being of affected populations. Integrating traditional knowledge with scientific approaches poses several challenges. Traditional knowledge is often context-specific and transmitted orally, making it difficult to document and incorporate into formal scientific research. Additionally, there may be lack of trust between communities and researchers to share this knowledge.

Addressing these knowledge gaps and challenges is important for coming up with effective and inclusive strategies to improve the resilience of rural communities to El Nino-induced drought. By focusing on localized experiences, cultural and psychosocial dimensions and integrating traditional knowledge with scientific approaches, there can be a better holistic and sustainable solutions.

2.10 Summary

This chapter highlights the significant effects of El Nino-induced drought on agricultural production, food security, socio-economic conditions and environmental resources, while emphasizing the psychosocial effects on farmers and the critical role of community support networks. However, gaps exist in understanding localized farmer experiences, cultural and psychosocial dimensions of drought impacts and integrating traditional knowledge with scientific approaches. This study addressed these gaps by focusing on the lived experiences of farmers in Ward 13, Muzarabani District, to provide a comprehensive understanding of drought

effects and inform effective interventions for enhancing resilience and well-being in this vulnerable region. After this chapter, it is followed by chapter 3 which is the methodology.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Chapter 3 outlines the research methodology that was utilized in this research to understand the impacts of El Nino-induced drought on agricultural and socio-economic well-being of farmers in Ward 13, Muzarabani District. The research methodology has various components including the study area, research design, target population, sampling procedures, data collection instruments, data collection procedure, data analysis techniques and ethical principles. Each of these components was carefully detailed to provide clarity and justification for the chosen methods, ensuring the validity and reliability of the study outcomes.

3.2 Study Area

The study focused on Ward 13 in Muzarabani District, located in Mashonaland Central Province, Zimbabwe. This area is particularly vulnerable to El Nino-induced droughts due to semi-arid climate and resilience on rain-fed agriculture. Ward 13 has a total number 745

households and a population of 3 039 people (ZIMSTAT, 2022) The selection of Ward 13 was justified with several factors including the dependence of households on farming, the rich socio-cultural heritage that influences local adaptation strategies and its frequent exposure to droughts. By examining the localized effects of drought and the adaptive methods employed by farmers in Ward 13, the study managed to generate ideas that can inform targeted interventions to improve the resilience and well-being of communities in similar contexts.

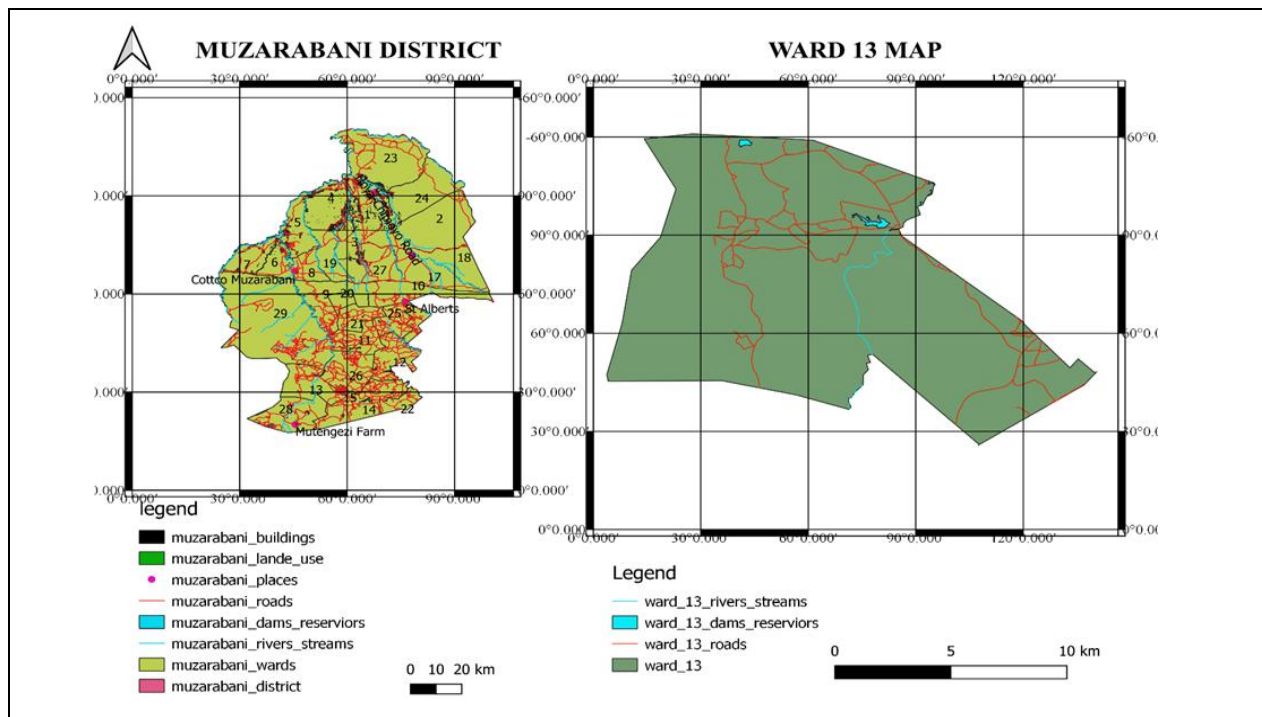


Figure 3.1 Study Area Map of Ward 13, Muzarabani District (Source: Author)

Figure 3.1 above shows the study area map where the data was collected. The map was created by the researcher using QGIS software and the shape files were obtained from the internet.

3.3 Research Design

The research used phenomenology as the research design, a qualitative approach centered on examining and understanding individuals' lived experiences and the essence of those experiences (Neubauer et al., 2019). Phenomenology delves into the subjective meanings that people attach to their experiences, aiming to uncover the core of phenomena as perceived by individuals. This design emphasizes engagement with participants through methods such as in-depth interviews to capture rich, nuanced and contextual insights. Several studies have successfully used the phenomenological design. For instance, van Manen (1990) explored the lived experiences of educators and students, offering insights into the essence of educational experiences. Similarly, Moustakas (1994) applied phenomenological methods to investigate

individuals' experiences in fields like therapy and education, highlighting the design's versatility in understanding human experiences across contexts. These studies illustrate phenomenology's strength in revealing the richness and depth of human experiences.

According to Gagura (2023), the strengths of phenomenology include its ability to capture in-depth and context-specific understandings of participants' experiences and its focus on the subjective meanings individuals attach to those experiences, while phenomenology has limitations, including the potential for researcher bias, difficulties in achieving bracketing (suspending preconceived notions) and challenges in generalizing findings to larger populations. Phenomenology has shaped this study by providing an overview for understanding the lived experiences, cultural interpretations and adaptive strategies of farmers in response to El Niño-induced droughts. This design allowed the study to focus on the essence of farmers' experiences, as it highlighted the depth and richness of their responses to climatic challenges. Despite its limitations, this study was anchored on phenomenology because it enabled a thorough exploration of socio-cultural dimensions often overlooked in quantitative research. The insights gained were crucial for developing culturally sensitive and context-specific interventions to enhance the resilience and well-being of rural communities.

3.4 Target Population

The target population for this research involved farmers in Ward 13, Muzarabani District, who are directly impacted by El Niño-induced droughts. ZIMSTAT (2022), Ward 13 has approximately 745 households. These farmers commonly rely on rain-fed agriculture, making them particularly exposed to the adverse effects of climatic variability. Their selection as the target population is justified by their firsthand experiences of drought impacts and their adaptation strategies, which are central to understanding the socio-economic and cultural dimensions of resilience in this context. Ultimately, this group provides valuable insights into localized vulnerabilities and coping mechanisms, offering a unique perspective that can inform context-specific and evidence-based interventions aimed at enhancing agricultural sustainability and community well-being.

3.5 Sampling Procedures

The sampling procedures for this study were designed to ensure a diverse and representative understanding of how different farm types in Ward 13, Muzarabani District, are impacted by El Niño-induced droughts. The sample size has been deliberately kept manageable while

representing the diversity of A1, medium, and A2 farms to reflect their unique vulnerabilities and adaptive strategies.

3.5.1 Sample Size

Determining an appropriate sample size is vital for ensuring that the research captures diverse perspectives while remaining feasible for data collection. This study will employ the Rule of Thump method to justify the sample size

Rule of Thump Method for Size Section

The Rule of Thump method is widely utilized in qualitative research to determine sample size based on practical considerations rather than strict statistical calculations. According to the research guidelines, for larger populations above 100 people, 1% to 3% of total population is typically used. For smaller populations below 100 people, 10% is often applied to ensure adequate representation.

Applying this method to Ward 13's population of 745 households:

- 1% of 745= 8 participants
- 2% of 745= 15 participants
- 3% of 745= 22 participants

The study engaged a total of 22 participants, which was distributed equally across the three farm types in Ward 13, Muzarabani District, to ensure a balanced representation of their unique experiences with El Nino-induced drought. Specifically, 7 participants were selected from A2 farms (90–120 hectares), which are characterized by their larger scale and relatively better capacity to manage resource-intensive challenges, another 7 participants were drawn from medium-sized farms (approximately 20 hectares), representing an intermediate scale with distinct pressures in balancing resource allocation and productivity and finally, 8 participants were taken from A1 farms (5–6 hectares), which are smaller operations often facing the greatest vulnerabilities due to limited resources and higher susceptibility to climatic shocks.

This structured approach ensures comprehensive coverage of the varying farm sizes and their specific experiences with droughts. The sample size was justified based on the principle of data saturation, where no new themes or significant insights emerged with the inclusion of additional participants. This ensures that the sample was not only adequate for exploring the research questions but was also feasible given the logistical and geographical challenges posed

by the spread of farms in the ward. Engaging participants from each farm type, made data collected to be comprehensive and it reflected the unique vulnerabilities and resilience mechanisms employed by different farmers.

3.5.2 Sampling Techniques

The research used purposive sampling, and snowball sampling to ensure a better and efficient selection of participants. Purposive sampling serves as the primary method, targeting participants with direct experiences of El Niño-induced drought and active involvement in farming to ensure the collection of relevant and insightful data (Campbell et al., 2020). Snowball sampling complements this by expanding the participant pool through recommendations from initial participants, which is especially helpful for identifying individuals with unique or less accessible experiences (Parker et al., 2019). Together, these methods created a well-rounded approach that balances practical considerations that were needed for diversity and inclusivity, this ensures the collected data effectively reflected the varied realities of farmers in the district.

3.6 Data Collection Instruments

The research utilized the following instruments for data collection namely interview guide, focus group discussion (FGD) guide, and observation guide. Each instrument played a critical role in systematically gathering data that aligns with the study objectives. Their detailed frameworks are provided in the appendices for cross-referencing.

According to Naz (2022), an interview guide is a structured tool that contains pre-determined questions aimed at guiding interviews to collect relevant and focused data from participants. It was used during one-on-one interviews, allowing the researcher to engage deeply with respondents and explore their personal narratives. The guide ensured a consistency in data collection across participants while allowing flexibility to probe into specific themes that emerge during the interviews (Naz et al., 2022). This approach uncovered detailed, firsthand accounts of how farmers managed drought-related challenges. The researcher conducted interviews with 2 participants from A2 farms on 24 January 2025, 2 participants from Medium farms on 25 January 2025, and 3 participants from A1 farms on 26 January 2025. The study was supposed to interview 10 participants, however only 7 farmers were interviewed due to no new themes emerged during the interviews. The interview guide was structured into several thematic sections. The first theme collected information about demographic characteristics which captured key background details of participants, followed by how farmers understand

El Nino and drought, this theme assessed farmers' knowledge and perceptions of climate-related challenges. The third one was impacts of El Nino-induced Drought which covered agricultural, socio-economic, and environmental effects. This instrument covered information about lived experiences and perceptions, coping mechanisms and adaptation strategies, gender-specific experiences, and recommendation. For cross-referencing see appendix 1.

A focus group discussion guide is a framework used to structure group discussions, ensuring they remain focused on the research objectives while encouraging the sharing of diverse perspectives (O. Nyumba et al., 2018). It is designed to explore shared experiences, community-level challenges and collective adaptation strategies to a certain problem. During the study, the FGD guide was used to guide discussions, ensuring that the conversation remains focused on key themes while encouraging open dialogue among participants. This instrument captured group dynamics, contrasting viewpoints and community consensus, providing insights into how farmers collaborated and adapted collectively. Focus group discussions was conducted on 24 January 2025 with 8 participants. The researcher was helped by the Ward Councilor to organize this discussion. The study was supposed to have a discussion with 12 participants, however only 8 participants took part because during that day many farmers were busy with food distribution which was being facilitated by Social Work Officials. The FGD guide was organized into the following themes, Understanding of El Nino and Drought Impacts, Socio-Economic and Environmental Impacts, Coping Mechanisms and Adaption Strategies, Community and Institutional Support, Gender and Social Dynamics, and Recommendation. For more clarity see appendix 3.

An observation guide is a systematic tool designed to document non-verbal, environmental and contextual data during research observations (Queiros et al., 2017; Kawulich, 2005). It was used to document non-verbal and contextual information, such as visible impacts of droughts, farming practices and environmental conditions in Ward 13. This instrument was used during site visits to capture details that did not emerged during FGDs and interviews, such as physical adaptations on farms or resource distribution. The observation guide complements the verbal data by adding a visual and environmental dimension to the study, ensuring a holistic understanding of the farmers' realities. The researcher managed to observe 2 A2 farms, 2 Medium farms, and 3 A1 farms on the same dates interviews were conducted on these farms. During the field visits the environment was also observed following the structure. The checklist was structured into the following themes: Environmental Indicators which tracks water availability, vegetation changes, and visible drought impacts, Household and Community

Indicators which assessed housing conditions, food storage, and communal resource-sharing, Socio-Economic Indicators observed market activity, asset depletion, and signs of economic distress, and Gender and Social Dynamic which noted gendered roles in labor and decision-making within farming communities. For more clarity see appendix 2.

3.6.1 Piloting the Instruments

According to Blaze et al. (2021), piloting is the process of testing the research instruments on a small subset of participants to ensure their suitability, clarity, and effectiveness in collecting the intended data. This critical step helps identify potential weaknesses in the instruments, allowing for revisions before the main data gathering begins.

In this research, the piloting process included testing the interview guide, the focus group discussion (FGD) guide and the observation guide with a small group of 5 respondents who shared same characteristics with the targeted population. These participants were selected from Ward 13 to reflect the diversity of the actual study population across A1, medium-sized and A2 farms. Piloting the interview guide helped assess whether the questions are clear, relevant and capable of eliciting detailed responses. Similarly, the FGD guide was tested to ensure that it promotes productive group discussions without diverging from key themes. The observation guide was used during brief site visits to confirm that it captures the necessary contextual and environmental details.

The feedback gathered during piloting was used to refine the instruments by addressing any issues such as unclear questions, leading phrasing, or gaps in content. For instance, participants found that certain questions in the interview guide were too broad, and they were rephrased to improve focus and specificity. This process made the instruments be aligned with the study objectives and effectively gathered comprehensive and reliable data during the main research. Additionally, piloting built the researcher's familiarity with using the instruments and it contributed to a smoother and more consistent during data collection process.

3.6.2 Validity of the Instruments

Validity is the extent to which an instrument measures what it is intended to measure and ensures the reliability of the outcomes (Taherdoost, 2016). In this research, the validity of the instruments was established through several measures to ensure the data collected was both accurate and relevant. Content validity was ensured by aligning the questions in the interview guide, focus group discussion guide and observation guide with the study's objectives. The

instruments were designed to comprehensively cover key themes such as the impacts of El Niño-induced droughts, adaptive strategies and community-level responses. Face validity was addressed by piloting the instruments, as discussed in Section 3.8.1. The piloting process helped to identify and address any ambiguities, it ensured that the questions were clear and understandable to participants. Triangulation also contributed to the validity of the study. By using multiple instruments namely interview guide, focus group discussion guide and observation checklists, helped the research to cross-check findings from different sources to ensure consistency and accuracy. This approach strengthened the credibility of the data and helped to minimize biases.

3.6.3 Reliability of the Instruments

Reliability refers to the consistency and dependability of an instrument in measuring what it is intended to measure across different contexts and over time (Taherdoost, 2016). In this study, measures were taken to ensure the reliability of the interview guide, focus group discussion (FGD) guide and observation guide. Consistency was maintained by using standardized guides for all data collection activities. The interview and FGD guides included clearly defined questions and prompts, which ensured that each participant or group was asked the same core questions in a consistent manner. The observation guide included pre-determined categories for documenting contextual details, it made the researcher consistently record relevant environmental and non-verbal data. Additionally, researcher training was undertaken to enhance reliability. The researcher practiced the use of the instruments during the piloting phase (as outlined in 3.8.1), and the researcher gained familiarity and minimized inconsistencies during the main data collection process. This step helped to reduce variability in how the instruments were applied. The reliability of the instruments was also strengthened through peer review, the institution supervisor reviewed all guides which made them to be clear, concise and capable of producing consistent results. This measure ensured the instruments to be dependable and suitable for the study's objectives.

3.7 Data Collection Procedure

The data collection procedure for this research followed a systematic process that ensured efficient and thorough collection of data relevant to the research questions. Before data collection begins, the researcher obtained ethical approval from Bindura University of Science Education, Office of the President and Cabinet, and Muzarabani District Development Coordinator (see appendix 4 and 5 for cross-checking). There preparatory phase which also

involved piloting the instruments, as outlined in Section 3.8.1, where tools were refined and ensure their clarity and effectiveness. Participants were recruited using the sampling techniques discussed in Section 3.7. This included purposive sampling to targeted individuals with direct experiences of El Niño-induced droughts, snowball sampling which identified additional participants through recommendations and got help from the Ward Councilor. This recruitment process ensured a diverse representation of participants from A1, medium-sized, and A2 farms.

The data collection included three activities guided by the instruments detailed in Section 3.8. One on one interviews were conducted using the interview guide which explored participants' personal narratives, coping mechanisms and adaptive strategies. These interviews took place mainly in farms because the study was conducted during the farming season in January 2025. Focus group discussions were facilitated using the FGD guide to capture shared challenges, community-level responses and collective adaptations. These discussions were moderated to ensure active participation and focused dialogue. Observations were conducted during site visits using the observation guide to document non-verbal data, farming practices, environmental conditions and visible drought impacts, enriching the context of the study.

All collected data was securely managed to protect participant confidentiality. Interviews and FGDs were recorded with respondents' consent and transcribed for analysis, while observational data was systematically recorded in an organized format. Post-collection, the researcher reviewed and cleaned the data to ensure accuracy and completeness, addressing any ambiguities through follow-up conversations. This structured procedure ensured an ethical data collection, efficient and comprehensive, that enabled the study to generate meaningful insights into the effects of El Niño-induced drought and the adaptive strategies employed by farmers in Ward 13.

3.8 Data Analysis Techniques

This research used thematic analysis as the primary technique that analyzed qualitative data. Thematic analysis includes identifying, analyzing and reporting patterns or themes within the data, providing a better understanding of respondents' experiences and perspectives (Terry et al., 2017). This method is particularly suitable for addressing the research questions as it allows for a detailed exploration of the socio-economic impacts of El Niño-induced drought, adaptive strategies and farmers' lived experiences.

The analysis begun with familiarization, where the researcher reviewed transcripts of interviews, focus group discussions and observation notes. Audio recordings of the interviews and FGDs were replayed to capture nuances such as tone, emphasis and context that were not evident in written transcripts. This thematic analysis reflected the depth and richness of participants' narratives. Coding was used which involved assigning labels to key phrases of the data that represent specific ideas, experiences, or patterns. Both inductive coding (themes emerging from the data) and deductive coding (themes guided by the research questions) were employed. The identified codes grouped into broader categories during the theme development phase. Themes were refined to ensure they are coherent, distinct and representative of the data. For example, potential themes might include perceptions of drought, socio-economic impacts, or effectiveness of adaptive strategies. This was done in chapter 4 of the study.

Photographs taken during observations were systematically reviewed to identify visual evidence that complements the verbal data. For instance, images of farming practices, visible drought impacts, or physical adaptations on farms validated or enriched emerging themes. These photographs served as an additional layer of evidence, providing tangible insights into the context of the study. Finally, a narrative synthesis integrated the themes with the research objectives and existing literature, offering a coherent account of the findings. Triangulation further ensured the credibility and reliability of the analysis by cross-referencing data from interviews, FGDs and observations, including audio and photographic materials. This integrative approach enhanced the depth and robustness of the findings, ensuring that the data collected comprehensively addresses the research questions.

3.9 Ethical Principles

Khan (2024) mentioned that, ethical principles refer to the fundamental guidelines and standards that ensured that the research was conducted in a way that respects the rights, dignity, and well-being of respondents. These principles provide a framework for maintaining the integrity of the study process and fostering trust between the researcher and respondents. One key principle is informed consent, which ensures that participants voluntarily agree to participate in the research after being fully informed about its objectives, methods, potential risks and benefits (Khan, 2024). In this study, informed consent were obtained through signed forms and participants were aware of their right to withdraw at any stage without any repercussions. Another critical principle is confidentiality and anonymity. The study protected participants' identities by anonymizing all collected data, including interview transcripts, focus

group recordings, and photographs. Personal identifiers did not appear in any reports or publications, and all data was securely stored to prevent unauthorized access.

Cultural sensitivity guided the research process. Respecting the customs, traditions and social norms of the community in Ward 13, Muzarabani District, made participants feel valued and understood. Finally, the study adhered to the principles of integrity and ethical compliance as outlined by institutional and professional guidelines. Ethical approval was sought from relevant review boards such as Bindura University and all research activities complied with these standards to safeguard the credibility of the research. Adhering to these ethical principles, the study ensured that all research activities were carried out responsibly and respectfully, protecting the rights and dignity of participants while maintaining the highest standards of academic integrity.

3.10 Chapter Summary

Chapter 3 presented the methodology of the research, highlighting steps and processes that will be employed to answer study objectives. It began by describing the study area and providing justifications for the chosen research design. The target population and sampling procedures were discussed in detail, outlining the techniques and sample size to ensure representativeness and depth of inquiry. The chapter also detailed the data collection instruments along with their piloting, validity and reliability measures to ensure rigorous data collection. The data collection procedure was then outlined, followed by an explanation of the thematic analysis techniques used to identify and interpret patterns within the data. Ethical principles, including informed consent, confidentiality and cultural sensitivity, were emphasized as central to the study's integrity. This detailed methodology set a foundation for chapter 4.

CHAPTER 4: DATA PRESENTATION, INTERPRETATION, AND DISCUSSION

4.1 Introduction

Chapter 4 presents the data, interpretation, and discussion of the research findings on the Farmers' Lived Experiences of El Nino-Induced Drought in Ward 13, Muzarabani District. The chapter follows a structured approach, starting with the response rate and demographic characteristics of responders, progressing through the results related to each research objective and ending with a discussion and a summary. The findings are organized basing on the following research's objectives.

1. To understand famers' lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.
2. To analyze the socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District.
3. To explore the adaptive strategies employed by farmers in response to El Nino-induced drought.

4.2 Response Rate

The response rate reflects the level of participant achieved in the research. Out of targeted sample size of 22 respondents, a total of 15 respondents participated in the study. This represents a response rate of 68%, as shown in Figure 4.1 below.

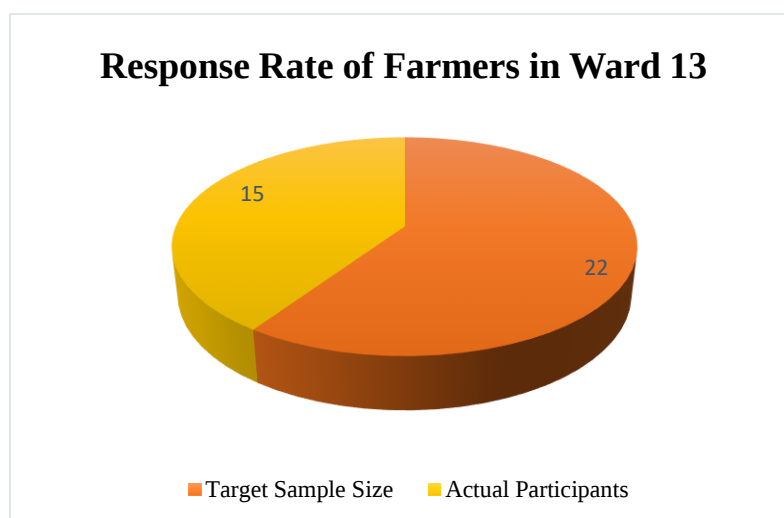


Figure 4.1. Response Rate of Study Participations (Source: Primary data)

The response attained reflected a moderate level of engagement among the targeted participants. This level of participation is sufficient for the qualitative nature of the study, as it allows an in-depth examination of farmers' lived experiences of El Nino-induced drought in Ward 13, Muzarabani District. Any potential impact of the 68% response rate on the validity and generalizability of the findings will be addressed in Chapter 5.

4.3 Demographic Characteristics of Participants

This section presents the demographic profile of the research participants, providing their profiles to contextualize their lived experiences of El Nino-induced drought in Ward 13, Muzarabani District. Table 4.1 below will highlight their diversity in gender, age, household size, educational level and farming experience.

Table 4.1 Demographic characteristics of Study Participants (Source: Primary Data)

Demographic Factor	Category	Number of Respondents (n=15)	Percentage (%)
Gender	Male	11	73
	Female	4	27
Age	18-30	2	13
	31-40	3	20
	41 and above	10	67
Household Size	1-3 members	1	7
	4-6 members	5	33
	7 and above	9	60
Level of Education	Primary Education	6	40
	Secondary Education	9	60
	Higher Education	0	0
Years of Farming Experience	0-5 years	0	0
	6-10 years	3	30
	11 years and above	12	80

Table 4.1 shows that there men participated more in agricultural activities than women. Out of 15 participant respondent, 11 were men. Most of the farmers in Ward 13 were aged 41 and above with 67% response rate. Many households in Ward 13 has members above 9 and most

of them attained secondary education of education level. Most of the farmers has 11 years and above of experience in farming.

4.4 Famers' lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.

This section presents the findings from the research, answering research object 1. Focusing on farmers' lived experiences of El Nino-induced drought in Ward 13, Muzarabani District. The findings are organized in themes derived from qualitative analysis and data from interviews, focus group discussions (FGDs) and observations are combined under each theme to ensure a comprehensive understanding of farmers' perspectives, challenges and coping strategies.

4.4.1 Psychological and Emotional Impact

This theme focuses on the emotional strain experienced by farmers and how they interpret these challenges emotionally and psychologically. When the researcher asked farmers their experiences and perspectives on the challenges of El Nino-induced drought during interviews. They shared their feeling of despair and helplessness due to crop failure and loss of livestock during El Nino-induced drought. From the interviews conducted during data gathering one farmers had to say:

"...I felt defeated seeing livestock dying and crops drying in the fields every time these droughts occurred, as it is hard to keep trying when nothing changes."

Farmers view the drought similar as an uncontrollable force, testing their capacity to resist or adapt to it. Farmers air out that:

"...El Nino-induced drought is beyond our control, however, it taught me patience and strength."

During FGDs, the researcher got collective emotional burdens from respondents that emphasizes the shared fear and stress within their communities. They also expressed deep emotion over their inability to provide basics and essentials for their families, as many spoke about feeling guilt as they fail to provide for the family during drought. During these discussions someone said that:

"...seeing my family hungry is the hardest thing for me, as it makes me feel like as a parent I am failing."

Respondents acknowledge the severe impact of drought as it affects cultural values and family dynamics. During Group Discussion some women farmers highlighted that

“...during the drought period, as women turn to unconventional and sometimes unfaithful ways to support families, challenging traditional roles and expectations. But it is heartbreaking and shameful as it leads to psychological and emotional impact.”

During field visits, the researcher observed farmers’ physical surrounding and behaviors that revealed their emotional impact. The researcher noticed that, many farms were not fully utilized, with farmers often sitting idly, reflecting feelings of fear, despair and discouragement. The researcher also noticed that, some homesteads had empty granaries and reduced number of livestock highlighting the tangible effects of drought, reflecting the emotional burden of feeding their families and maintain their livelihood. Witnessing moments of silence to speak about their challenges during informal conversations also indicate deeper emotional impact.



Figure 4.2 Unutilized Farms and few livestock (Source: Primary Data)

4.4.2 Challenges in Farming and Daily Life

This theme digs deep into the tangible challenges farmers in Ward 13 encounter, such as resource shortages, financial constrain and disruptions to their farming activities and household dynamics. It also explores their perspectives on the root causes of these challenges and potential solutions. From the interviews conducted, farmers emphasized water scarcity and crop failures as their most pressing challenge. Many farmers are being forced to sell livestock to sustain their families and others leave farming and join artisanal miners. One of the respondents said that:

“...Without water, our plants dry up, and without crops, we have no money or food. It is a vicious cycle.”

Some farmers also mentioned that:

“...Without water there no pastures, hence reduced number of livestock. The drought sometimes left us with nothing as it affects both crops and our livestock.”

Participants expressed frustration with delayed government assistance and insufficient external support to address drought-related issues. Farmers noted that:

“...During the distribution of inputs such as seeds under the Pfumvudza Program, we wait for the distribution and it usually arrive after planting season has already passed.”

During focus group discussions, the researcher got collective concerns about the cost of farming inputs like seeds and fertilizers during droughts. The group noted that:

“...We all face the same challenge, everything is so expensive and we cannot afford to buy everything we need in the fields.”

Some farmers from A2 farms mentioned that:

“...Electricity shortage is one of the biggest challenge as big farmers we need more power to pump more water and curing our tobacco.”

Participants suggested that better collaboration between farmers and stakeholders could reduce some challenges, such as shared irrigation systems or community loans. The group highlighted that:

“...If we could pool resources as a community, we can overcome some of the challenges, like A2 farmers helping A1 and Medium farmers with irrigation systems.”

The researcher observed a lot of things that showcased challenges which are being faced by farmers. The researcher noticed some sparse, dry fields with stunted crops, and in A1 and Medium farms the researchers noticed that, farmers are using Scotch carts to fetch water for spraying and there were no signs of irrigation systems and power lines. These physical observations reflected challenges that are beings faced by farmers, showcasing their experience with El Nino events.



Figure 4.3 Fields with Stunted Crops and Farmers using Scotch carts to Fetch Water (Source: Primary Data)

4.4.3 Coping Mechanisms and Adaptive Strategies

This theme examines the varied strategies used by A1, Medium and A2 farms in Ward 13 to cope with and adapt to El Nino-induced drought. During interviews the researcher found out that A1 and Medium farmers rely on small dams for water storage, combined with mixed farming practices to diversify risks. They grow tobacco for income and maize for household food security. Participants mentioned that:

“...we have a small dam that helps us to store water, and by growing both tobacco and maize, we can balance our need. That’s is we will not spend a lot of money earned from tobacco to buy food especially maize for Millie meal.”

These farmers acknowledge the limitations of their resources, noting that small dams sometimes dry up during prolonged droughts. Respondents highlighted that:

“...when the El Nino-induced drought lasts too long, the dam runs dry, leaving us at vulnerable hoping for rain.”

A2 farmers mentioned the use of irrigation systems, boreholes and water tanks, allowing them to sustain tobacco production, particularly during its critical growth stages. Participants mentioned that:

“...we can water our tobacco even during dry spell because of our boreholes and storage tanks, which keeps us going.”

These A2 farmers also went on to note that, although they have the capacity to sustain during dry spells, it is costly to maintain such infrastructure. Farmers said that:

“...the investment in irrigation systems needs a lot of capital, therefore it not an option for everyone as it needs a lot of money.”

When focus group discussions conducted, farmers from A1 and Medium farms mentioned the importance of mixed method farming and used of small dams as strategies to mitigate drought impacts. Respondents noted that tobacco is more drought-resistant than maize, but they grew maize to meet food needs. Participants highlighted that:

“...we grew tobacco for income generation, maize helps use to feed families, reducing spending more earned from tobacco on food.”

During the discussions, respondents agreed that farmers from A2 farms have an advantage due to their irrigation systems, while smallholder farmers feel disadvantaged in their ability to adapt. Participants said that:

“...we will try to help each other with irrigation equipment, so that smaller farmers will be able to mitigate El Nino-induced drought better. And as small farmers we will also try our best to make big and more dams.”

During field visits, the researcher observed small dams on A1 and Medium farms and mixed farming practices which include tobacco and maize. While, A2 farms displays irrigation systems, boreholes and water tanks, with well-maintained tobacco fields. These observations showcased the different coping capacity across farm categories in Ward 13, emphasizing that resource availability strongly influences adaptive strategies.



Figure 4.4. Irrigation System and Small Dams (Source: Primary Data)

4.5 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District

This section examines the socio-economic repercussions of El Nino-induced drought, analyzing its effects on livelihoods, income and community dynamics. Insights are drawn from interviews, focus group discussions, and observation showing how the drought reshaped social structures and economic activities among farmers.

4.5.1 Economic Impacts

This subsection examines the how El Nino-induced drought impacted economic activities of farmers in Ward 13. During interviews, farmers highlighted a lot economic challenges being posed by droughts. They mention reduction in agricultural produce leads to fundamental financial losses. This made a lot of farmers to sell assets like livestock, especially farmers from A1 and Medium farms. Respondents mentioned that:

“...droughts lead to economic challenges as we fail to compete in both local and national markets, hence low income. We end up selling assets like livestock to cope up with the situation.”

Farmers expressed a sense of economic vulnerability, worrying about their ability to recover after repeated droughts. Participants highlighted that:

“...each drought leaves us poorer, we lose almost everything and it takes a long period to recover.”

During FGDs, farmers shared a lot of economic impacts posed by droughts. Farmers mentioned about the rising of inputs prices such as fertilizers and seeds, this lead them in having huge credits from friends, banks and financial institutions. Participants noted that:

“...we cannot afford fertilizers anymore and without good inputs we harvest almost nothing.”

Participants called for better inputs and financial support systems like providing back the Command Agriculture Scheme and loans, which used to help them to sustain their farming activities. Respondents noted that:

“...if the government launch back the Command Agriculture Scheme, especially to the active farmers like youths who are in farming and low interest loans, we could invest in irrigation and at least survive.”

The researcher observed that, many farmers has reduced number of livestock, children being at home during school days and reduced number of hectors being cultivated. This indicated limited capacity of farmers to send children to school and inputs to fully utilize their farms. These visible signs of financial strain reflect a general struggle to achieve economic resilience, especially among farmers from A1 and Medium farms.

4.5.2 Social Impacts

This section is going to present finding that will showcase how El Nino-induced drought affected community dynamics, family roles and social cohesion. During interviews farmers described strained family relationships due to financial pressure, with some families breaking down under the stress of meeting basic needs. Participants mentioned that:

“...most of the times we argue whether to pay school fees or buying food.”

Participants expressed concern over a high rate of school drop outs. Farmers mentioned that:

“...many children are not going to schools due to low agricultural productions as it is the main livelihood strategy in Ward 13.”

During focus group discussions, respondents mentioned a decline in social trust and cooperation, especially when resources like water become scares. Competition for limited water led to conflict. Farmers highlighted that:

“...as community members we used to be one thing helping each other, but now everyone is looking out for themselves.”

Despite the tensions, some farmers viewed drought as an opportunity for communities to come together, especially through collective labor for digging wells and maintaining dams. Participants mentioned that:

“...during bad times, is the best time you see people coming together and it shows that we can still rely on each other.”

During field visits, the researched noticed that there were a lot of children who did go to school help parents in the fields, and some families had no fathers showing break ups of households. The researcher also observed sharing of equipment like pipes among farmers. These observations reflected both the challenges to social life of people in Ward 13 and the resilience of certain members in fostering collective responses.

4.6 The adaptive strategies employed by farmers in response to El Nino-induced drought

This section presents the several adaptive methods employed by farmers in Ward 13, Muzarabani District, emphasizing the differences between A1, Medium and A2 farms in their approaches. These strategies reflect farmers' efforts to mitigate the impacts of drought through crop choices, infrastructure investments and farming practices.

4.6.1 Crop Choices and Farming Practices

This section examines how crop choices and farming methods help them to adapt and cope to drought conditions. Farmers across all categories emphasized their preference for tobacco due to its drought-resistant nature as compared to maize. Mixed farming was commonly practiced, known as a traditional farming method. Farmers grew tobacco for income generation and maize for household consumption. Respondents mentioned that:

“...we prioritize tobacco farming because it survives better during dry spell periods, but we still grow maize for food.”

Farmers expressed confidence in tobacco as a reliable crop in their area due to the occurrence of droughts, but they also noted concerns about reduced food security due to lower maize yields. Participants highlighted that:

“...tobacco gives us money, but sometimes it is hard to get enough maize to feed our families.”

During focus group discussions, a lot of strategies were discussed which are being used by farmers. Farmers highlighted the widespread use of drought-resistant seeds for crops such as maize, mentioning varieties like Pioneer, Tsuro, Mbizi and others that mature quickly. Farmers mentioned that:

“...using drought-resistant seeds and varieties that mature early helps us harvest better, even when the rains fail.”

Farmers put more emphasis on the importance of accessing drought-resistant seeds and early maturity seeds, viewing them as an essential part of their adaptation strategy. Respondents noted that:

“...failing to access these seeds, we cannot survive these droughts because seasons are now short and we are receiving very low rains.”

During field visits, the researchers noticed mixed farming practices where farmers are growing tobacco and other crops especially maize and there were drought resistant maize varieties. Mainly A1 and Medium farms have both tobacco and maize. These observations underscore the adaptive benefit of combining resilient crop varieties with diversified farming practices.



Figure 4.5 Mixed Farming (Source: Primary Data)

4.6.2 Water Management and Infrastructure

This section focuses on the strategies farmers in Ward 13 employed to manage water resources effectively. Farmers in A2 farms explained the use of boreholes, water tanks and irrigation systems to ensure consistent water supply for their tobacco crops during transplantation stage and other stages require more water. A1 and Medium farmers mentioned the use of small dams for water storage. Participants mentioned that:

“...as A2 farmers with our boreholes and irrigation systems we can manage to have better yields during dry spells.”

Other respondents also mentioned that:

“...as A1 and Medium farms we built small dams to store water so that we can at least sustain some of our crops.”

Farmers from A2 farms expressed their confidence in their water infrastructure, however, repeated droughts leading to the depletion of underground water. A1 and Medium farmers highlighted challenges in maintaining their small dams during long dry spells. Participants mentioned that:

“...our dams help to a greater extent, but when the drought last long, they dry up very fast and boreholes are being affected by repeated droughts.”

When FGDs conducted, farmers highlighted community efforts to repair dams and dig wells, emphasizing the shared reliance on water storage during El Nino-induced drought. Participants noted that:

“...working together to construct and fix our dams has helped us to have better harvest during drought times.”

Farmers viewed water management infrastructure as a major priority for both individual and collective resilience. Respondents highlighted that:

“...if we don't look after water sources, we will all suffer more during drought times.”

During observation, the researcher notices boreholes, water tanks and irrigation systems on A2 farms, while small dams were noticed commonly on A1 and Medium farms. These observation, showcased strategies being implemented by farmers in Ward 13.



Figure 4.6. Water Tanks and Small Dams (Source: Primary Data)

4.6.3 Indigenous Knowledge (IK) for Drought Prediction

This section examines how farmers in Ward 13 utilized IK to predict drought conditions, enabling them to make informed decisions in their agricultural activities. During interviews, farmers noted the observing of animal behaviors and changes in fruiting patterns as indicators of upcoming drought. Participants mentioned that:

“...when we see certain birds and animals migrating earlier than usual or when we see some fruits bearing more fruits such as Nhunguru and Hacha, we know that the rain will come late or very little.”

Farmers highlighted the use of indigenous knowledge to predict droughts as one of the reliable method in traditional methods. Farmers predict droughts through observing animal behaviors and changes in fruiting patterns or yields of wild fruits. Participants mentioned that:

“...by paying attention to the environmental changes, we can know whether the year will give us more rainfall or drought, therefore we can make informed decision about planting, harvesting and managing our land.”

During FGDs farmers noted that, IK is a shared knowledge of environmental patterns which is passed down through generations, allowing them to adjust planting schedules and crop selection effectively. Participants said that:

“...we learn this method from our elders to watch fruits and animals behaviors, as will help us to forecast the weather.”

Farmers showed pride in using indigenous knowledge, considering it an integral part of their culture and farming practices. Respondents mentioned that:

“...it is our culture and that is us, these methods are fundamental as modern practices too.”

During field visits, the researchers noticed some of the environmental changes that were discussed by farmers. Some of the fruit trees have more fruits promising to yield more. These observations reflected that occurrence of drought in the area according to their culture. It highlighted the deep connection between farmers and the environment, relying on traditional knowledge to complement other coping strategies.

4.7 Discussion

This section discusses the research findings in relation to the broader literature on El Nino-induced drought, highlighting similarities and differences with existing studies. It examines possible explanations for the differences, such as geography and methodological factors. This section is structured according to the study objectives.

4.7.1 Famers’ lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.

After presentation of the research findings on the first objective, which analyzed farmers’ lived experiences and perspectives, the study outcomes aligned with the study carried by Guthiga et al. (2024), which exposed high stress and anxiety due to reduced food security posed by drought. Both researches put more emphasis on the heavy emotional burden farmers carry in ensuring food for their families. Similar to Ghosh et al. (2024), the study findings also revealed that water scarcity worsen challenges, with farmers adopting strategies like mixed farming to reduce drought shocks. However, there are some differences with the literature. Guthiga et al.

(2024) focused mainly on maize production, while the research findings indicated a stronger emphasis on tobacco farming in Ward 13 as a livelihood and coping strategy. This difference might stem from the suitability of tobacco for the local climate as the findings stated about tobacco being resistant to drought than maize and economic importance as it is a cash crop. Therefore, this created a difference between Ward 13 and other areas.

4.7.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District

The research finding showcases the socio-economic impacts caused by El Nino-induced drought in Ward 13. These outcomes aligned with Ghosh et al. (2024) and Guthiga et al. (2024), which similarly noted fundamental economic instability and food insecurity posed by El Nino-induced drought. A study by the Ministry of Lands, Agriculture, Fisheries, Water, and Rural Development (2024), discussed social consequences of drought as it highlighted social impacts such as strained family relationships and disrupted community cohesion, parallel the themes of this research findings. However, there are differences with the literature and research findings. From the study carried by the Ministry of Lands, Agriculture, Fisheries, Water, and Rural Development noted the success of utilization of agricultural interventions like Pfumvudza, while the research findings suggested that these interventions are not widely practiced in Ward 13. This is because of tobacco farming, which does not need the utilization of this intervention and farmers in Ward 13 use large land pieces of land for example A1 farms which are the small ones are about 5 to 6 hectares which needs a lot of labor to do Pfumvudza.

4.7.3 Adaptive strategies employed by farmers in response to El Nino-induced drought

The outcomes of this research noted a lot of methods like the use of drought resistant seeds, which aligns with the adaptive measures discussed by Guthiga et al. (2024). Community-based strategies such as pooling resources and repairing dams, parallel with themes in the Ministry of Lands, which also put more emphasis on collective approaches to resilience building. However, there are differences with the literature and the research findings. The research finding underscored the use of indigenous knowledge for weather forecast, which was less emphasized in the studies reviewed. The emphasis of traditional knowledge for drought prediction in this study reflects the cultural richness of Ward 13, which might be less pronounced in other regions from reviewed studies.

4.8 Summary of the Chapter

This chapter explored the research findings and discussion based on the study objectives. It mentioned farmers' emotional and socio-economic challenges, like financial instability and strained relationships in families, posed by El Nino-induced drought. The chapter also highlighted the adaptive strategies varied across farm categories, with farmers from A2 farms employing irrigation systems and A1 and Medium farms relying on small dams and mixed farming. Traditional knowledge was vital for drought prediction. The discussion compared these findings with the existing literature, showing similarities like economic instability and the use of drought tolerant seeds, as well as differences like tobacco farming's prominence in Ward 13. These divergences were linked to cultural, geographical and economic factors, developing the basis for conclusions and recommendations.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

Based on the study's findings, which were reported in chapter 4 of this research, therefore, this chapter provides the study's conclusion and recommendations. This chapter discussed the conclusions of each and every objective respectively and it will also provide recommendations for the challenges that were reviewed in the conclusions. With this structure, the chapter will shed light on the farmers' lived experience on El Nino-induced drought in Ward 13, Muzarabani District and provide recommendations that can be adopted by NGOs, Government, and others policy makers.

5.2 Summary

This section summarizes the key outcomes of the research based on the research objectives. The results indicated that farmers in Ward 13, Muzarabani District, experienced El Nino-induced drought differently due to variations in farm size and resource availability. The ward consist of A1 farms (5-6 hectares), Medium farms (approximately 20 hectare), and A2 farms (90-120 hectares), each with different coping capacities.

5.2.1 Famers' lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.

Farmers in A1 farms are exposed more to drought due to resource shortage. They lack boreholes, water storage facilities, and irrigation systems, making it difficult to sustain farming during dry periods. Medium farm owners also struggle, as they cannot afford to install boreholes or irrigation systems and face challenges in purchasing farming inputs due to high costs. Farmers with A2 farms are equipped with better boreholes, water storage facilities, and irrigation systems, still experience drought impacts as repeated droughts cause boreholes and water sources to dry up, affecting their farming activities. Across all farm categories, farmers expressed deep concern over the unpredictable of rainfall patterns, which complicates planting decisions. Many farmers shared a sense of frustration over the rising costs of farming inputs, making it harder to sustain their livelihoods. Despite these challenges farmers showed resilience, relying on both traditional and modern strategies to cope with drought conditions

5.2.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District

The findings indicated that economic constraints fundamentally affect farmers' ability to cope with drought. A1 and Medium farmers face financial difficulties in acquiring farming inputs

such as seeds and fertilizers, which are increasingly expensive. The lack of irrigation infrastructure further exacerbates their vulnerability. A2 farmers, are less affected but still experience financial strain due to the costs associated with maintaining irrigation systems and boreholes, especially as water sources diminish over time. Farmers reported that drought has led to reduced household food security, forcing many to buy maize instead of growing it. Furthermore, financial strain has affected social structures, with some families struggling to pay school fees. The drought has also intensified competition for water resources, leading to occasional conflicts among farmers, especially those relying on shared water sources.

5.2.3 The adaptive strategies employed by farmers in response to El Nino-induced drought

Farmers across all categories utilized different adaptive methods to mitigate the impacts of drought. A1 and Medium farmers rely on mixed farming, growing both tobacco and maize to balance income and food security. They also construct small dams for water storage and use traditional methods to predict drought, such as observing environmental changes. A2 farmers, with better infrastructure, continue to use irrigation systems but face challenges as boreholes dry up due to repeated droughts. Farmers emphasized the importance of indigenous knowledge in predicting droughts, using environmental cues such as animal behavior and fruiting patterns to anticipate dry conditions. Moreover, community collaboration plays fundamental role, with farmers working together to repair small dams, share farming inputs, and exchanging knowledge on drought-resistant crops.

5.3 Conclusions

This sections will provide the research conclusions based on the objectives. Therefore, according to the research findings one can draw conclusion that are in line with the study objectives.

5.3.1 Famers' lived experiences and perspectives on the challenges and coping mechanisms during El Nino-induced drought events.

The study concluded that, farmers in Ward 13, Muzarabani District experienced psychological and emotional impacts of El Nino-induced drought. Drought can be viewed as an uncontrollable force, as it is beyond anyone's control. There are notable challenges farmers faced such as resource shortages and financial constrain. In farming the most pressing challenges are water scarcity and crop failure. One can also conclude that, the major coping strategies are the use of small dams, mixed farming to diversify risks, use of boreholes, irrigation systems, use of water tanks, and use of traditional methods to predict drought.

5.3.2 The socio-economic impacts of El Nino-induced drought on farmers in Ward 13, Muzarabani District

In conclusion, El Nino-induced drought impacted economic activities of farmers in Ward 13 to a greater extent. Drought led to low agricultural production which made farmers to earn very little money. The competition in the markets was very low. Farmers were forced to sell their property such as livestock. Droughts made farmers to fail to recover quickly as they are failing to buy inputs and other farming materials due to economic losses. El Nino-induced drought also affected the social life as it led to strained family relationships due to financial pressure, with some families breaking down under the stress of meeting basic needs. There are high school drop outs and community members fight for limited water sources which erodes social cohesion in the area.

5.3.3 The adaptive strategies employed by farmers in response to El Nino-induced drought

The research concluded that, various strategies are being made in Ward 13 to reduce the impact of El Nino-induced drought. Farmers who took part in the interviews and focus group discussion mentioned some of the strategies that are being used in the area. They include, crop choices and farming practices. Farmers in Ward 13 mainly grow tobacco since it is more drought resistance in the area and it provided a lot of income and they also practice mixed farming. They grow both tobacco for income generation and maize for supplementing food in the families. There are also water management and infrastructure strategies, farmers in Ward 13 used small dams, boreholes, irrigation systems, and water tanks. There is the use of traditional knowledge to predict drought. Farmers observed the behaviors of animals and change in fruiting patterns to predict the weather.

5.4 Recommendations

Basing on the research findings and objectives it was recommended that:

- ❖ The government has to bring back the Command Agriculture. Command Agriculture provides farmers with farming inputs and equipment. This will help farmers to have better yields as they will manage to have inputs in time and reduce the burden of buying expensive inputs. However, this initiative has to target especially the active population such as youths in agriculture.
- ❖ Water is one of the priorities of all farmers, therefore, the Presidential Borehole Drilling Scheme must also target farmers in Ward 13, Muzarabani District, so that they can be helped during dry spells to water their crops during critical stages. There are also NGOs

who help farmers, they also need to help farmers in Ward 13 with borehole drilling and other initiatives that can provide water which can sustain them during dry periods, such as rehabilitation of dams to store more water.

- ❖ Education awareness campaigns are also important in this Ward. Institution like Environmental Management Agency and the Ministry of Lands must educate tobacco farmers on the dangers of forest deforestation and encourage them to plant trees or replace a tree after they use them to cure tobacco. They need to advise them to use electricity and other methods of curing tobacco. Additionally, farmers need to be educated on the best methods to conserve underground water, such as to abandon the use of flood irrigation which waste a lot of water.
- ❖ The Government and other NGOs who provide loans to farmers must provide loans with lower interest so that farmers will be able to pay back. This will help farmers to have money to buy inputs and equipment such as materials for irrigation and seeds that mature early and which are drought resistant. This will make farmers cope and adapt to droughts.

5.5 Further Research Implications

The study was carried out in Ward 13, Muzarabani District, Mashonaland Central and there is the need for further research in different districts so as to have comprehensive and accurate results.

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APPENDICES

APPENDIX 1: INTERVIEW GUIDE

Good day, my name is Most Leeroy Kakunguwo, a student from Bindura University of Science Education and I am conducting research on farmers' lived experiences with Elnino-induced Drought and the study aims to provide critical information to intervention agencies such as the non-governmental organizations and government departments, to inform and improve their drought mitigation and response in Ward 13, Muzarabani District. I want you to know that your participation in this study is voluntary and you are free to withdraw at any time. All information shared will be kept confidential. The interview will take approximately 45 minutes to an hour. Before we start, I need to obtain your informed consent. Please let me know if you are willing to take part in this study and I will provide you with a consent form to sign.

1. Demographic Information

- Name (optional) or initials:
- Gender:
- Age:
- Household size:
- Level of education:
- Years of farming experience:

2. Understanding of El Niño and Drought

- Have you heard of El Niño? If yes, how would you describe it?
- How would you describe the recent droughts in this area?
- In your view, are these droughts becoming more frequent or severe? Why do you think this is the case?

3. Impacts of El Niño-Induced Drought

Agricultural Impacts

- How has the drought affected your crop yields and livestock?
- Have you noticed any changes in the growing seasons or rainfall patterns?

Socio-Economic Impacts

- How has the drought affected your household's income and food availability?
- Have you or anyone in your household considered migrating due to the drought?

Environmental Impacts

- What changes in the environment have you observed as a result of drought (e.g., water sources, soil fertility)?

4. Lived Experiences and Perceptions

- How has the drought affected you and your family on a personal level?
- What emotions or thoughts come to mind when you think about the drought?
- How do you feel about your ability to recover from or adapt to these challenges?

5. Coping Mechanisms and Adaptation Strategies

Traditional Strategies

- What traditional or indigenous methods have you used to cope with drought?
- Are these methods still effective? Why or why not?

Modern Strategies

- Have you adopted any modern farming techniques or technologies to deal with the drought?
- What challenges have you faced in accessing modern adaptation resources (e.g., irrigation, drought-resistant seeds)?

Community and Institutional Support

- Have you received any support from the government, NGOs, or community organizations?
- If yes, what kind of support, and was it helpful?
- What additional support do you think is needed to help farmers cope with droughts?

6. Gender-Specific Experiences

- How has the drought affected men and women differently in your community?
- Are there specific roles or responsibilities that women have taken on during the drought?

7. Suggestions and Recommendations

- What do you think can be done to help farmers better prepare for or cope with droughts?
- Are there any policies or programs you would like to see implemented to support farmers in this area?
- What role do you think local knowledge and traditions should play in addressing drought challenges?

8. Conclusion

- Is there anything else you would like to share about your experiences with the drought?

Thank you for taking time to share your experiences and insights with me. Your input is valuable in helping us better understand the impacts of Elnino-induced drought on farmers and develop effective strategies for managing it.

APPENDIX 2: OBSERVATION GUIDE

1. Objective of the Observation

To systematically document the physical, social, and environmental impacts of El Niño-induced drought and the coping mechanisms employed by farmers in Ward 13, Muzarabani District.

2. Key Areas of Observation

Table 1: Observation Checklist

Broad Concept	Sub-concepts		Yes	No	Comment
Environmental Indicators	Conditions of farmland				
	Water Sources				
	Vegetation				
Household and Community Indicators	Storage Facilities				
	Livestock				
	Drought coping infrastructure				
Socio-Economic Indicators	Marketplaces				
	Housing conditions				
	Community interactions				
Gender and Social Dynamics	Roles and responsibilities				
	Vulnerable groups				

APPENDIX 3: FOCUS GROUP DISCUSSION (FGD) GUIDE

Introduction.

I welcome and thank you all for coming today. My name is Most Leeroy Kakunguwo and I am a student from Bindura University of Science Education. I am conducting this focus group discussion as part of my study on Farmers' Lived Experience of Elnino-induced Drought in Ward 13 Muzarabani District. To add on, we will be audio recording to ensure that we won't miss any of your answers. The discussion session will take about one and half hours in total. Your input and participation are valuable in helping to understand the impacts of Elnino-induced droughts on your community.

Purpose of the Focus Group Discussion.

I am conducting a study on Farmers' Lived Experiences of Elnino-induced Droughts in Ward 13, Muzarabani District. The purpose of this focus group discussion is to facilitate a shared discussion among farmers to explore their collective experiences, perceptions, and strategies for coping with El Niño-induced drought, while identifying community-level challenges and opportunities.

Confidentiality.

Before we start, I want to assure you that all information we will collect here today is confidential. The information you will provide will be used and we will not identify any of you in anything we do that is related to this meeting. For example, we will not use your name, address or any other identifying information in reports or other materials related to this focus group. And note that this is voluntary.

Ground rules:

- Respect everyone's opinions.
- Only one person speaks at a time.
- Keep mobile phones silent.

Discussion Guide

A. Opening

1. Can you briefly introduce yourself and share how long you have been farming in this community?
2. How would you describe farming in Ward 13 over the past five years?

B. Understanding El Niño and Drought Impacts

3. What are your experiences with drought in recent years?
4. How would you describe the effects of El Niño-induced drought on your farming activities?
5. What changes in rainfall patterns or seasons have you observed?

C. Socio-Economic and Environmental Impacts

6. How has the drought affected your household income and food security?
7. What are the biggest challenges you face as a community during drought periods?
8. What environmental changes (e.g., water sources, vegetation) have you noticed due to drought?

D. Coping Mechanisms and Adaptation Strategies

9. What methods or strategies do you use to cope with drought?
10. Are there any traditional practices or indigenous knowledge systems that help you deal with drought?
11. Have you adopted modern farming techniques or technologies? If yes, how effective are they?

E. Community and Institutional Support

12. What support have you received from local government, NGOs, or other organizations during droughts?
13. How effective have these interventions been in addressing your needs?
14. What additional support or resources would help you cope better with drought?

F. Gender and Social Dynamics

15. In what ways do men and women experience drought differently in this community?
16. Are there specific roles or responsibilities that women take on during drought periods?

G. Suggestions and Recommendations

17. What do you think can be done to better prepare farmers in your community for future droughts?
18. Are there any policies, programs, or initiatives you would like to see implemented to address drought impacts?

4. Closing the Discussion

I would like to take opportunity to thank you all for taking your time to participate and share your experience and your insights are valuable.

APPENDIX 4: Approval Letter from Bindura University of Science Education

MCP/5/8

56

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

 P Bag 1020
BINDURA, Zimbabwe
Tel: 071 - 7531-6, 7621-4
Fax: 263 - 71 - 7534/6316

BINDURA UNIVERSITY OF SCIENCE EDUCATION

21 January 2025

→ ADPC
FIA 22/01/25

To Whom It May Concern

**ETHICAL CLEARANCE FOR THE STUDENT WHO IS SEEKING
INFORMATION FOR RESEARCH PROJECT**

This is to confirm that Kakunguwo Most L Registration Number: B212200B is a student doing Bachelor of Science Honours Degree in Development Studies at Bindura University of Science Education and is required to do a research project as a requirement for completing the degree program. The student is expected to gather data for the research project from various sources including your institution.

This letter therefore, serves to kindly ask you to assist the above-mentioned student with information relating to her project entitled:

**FARMERS' LIVED EXPERIENCES OF ELNINO-
INDUCED DROUGHT: EVIDENCE FROM WARD 13,
MUZARABANI DISTRICT, MASHONALAND
CENTRAL**

Feel free to communicate with us if any further assistance/ information is required

Thank you.


DR JOHN BOWORA
CHAIRMAN SUSTAINABLE DEVELOPMENT
+263773281212
jbowora@buse.ac.zw

**CHAIRMAN
GEOGRAPHY DEPARTMENT
FACULTY OF SCIENCE**

**DISTRICT DEVELOPMENT CO-ORDINATOR
CENTENARY DISTRICT OFFICE**

23 JAN 2025

**P.O. BOX 52, CENTENARY
MASHONALAND CENTRAL**

**OFFICE OF THE PRESIDENT AND CABINET
RECORDS AND INFORMATION**

21 JAN 2025

**MASHONALAND CENTRAL PROVINCE
ZIMBABWE**

APPENDIX 5: Approval Letter form Office of the President and Cabinet

OFFICE OF THE PRESIDENT AND CABINET MASHONALAND CENTRAL PROVINCE		
TEL: (066210) 6971/ 7598 opcmashcentral@gmail.com All communications should be addressed to the Secretary for Provincial Affairs and Devolution	 ZIMBABWE	Secretary for Provincial Affairs and Devolution P.O Box 300 1 st Floor Mutungagore 567 Thurlows Avenue BINDURA

23 January 2025

The District Development Coordinator
Muzarabani

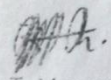
PERMISSION TO CARRY OUT AN ACADEMIC RESEARCH IN MUZARABANI DISTRICT FOR KANGUWO MOST L. AN UNDERGRADUATE STUDENT AT BINDURA UNIVERSITY OF SCIENCE EDUCATION, REG NO B212200B

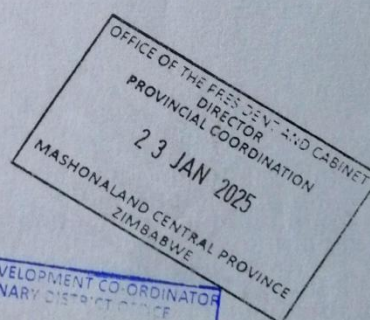
The above subject matter refers.

Permission has been granted to Kanguwo Most L B212200B an undergraduate student at Zimbabwe Bindura University of Science Education to carry out research in Muzarabani District. The nature of the research requires the student to use primary documents and to carry out oral interviews with relevant key informants. His research topic is *"Farmers' Lived Experiences of El Niño Induced Drought: Evidence from Ward 13, Muzarabani District in Mashonaland Central Province"*. Your assistance and cooperation will be greatly appreciated as this will facilitate the success of his research project.

Please note that the student is strongly obliged to adhere to all ethical expectations during the course of the research.

Thank you.

PP 
T. Maregere
SECRETARY FOR PROVINCIAL AFFAIRS & DEVOLUTION
MASHONALAND CENTRAL PROVINCE



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