BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SOCIAL SCIENCES AND HUMANITIES

DEPARTMENT OF PEACE AND GOVERNANCE

The Effects of Water Scarcity on Human Security in Rushinga District. A Case Study of Ward 18 (Mazoe Bridge)

By

Vanessa Vimbai Mungofa, Reg Number B211088b

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Supervisor: DR MUCHEMWA

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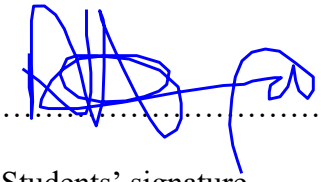
ABSTRACT

This study sought to assess the effects of water scarcity on human security, specifically focusing on the aspect of health security in Rushinga District. The objectives of the study were to investigate the causes and consequences of water scarcity on health security in Rushinga District., to assess the effectiveness of existing water management strategies and policies and to evaluate how water scarcity impacts access to healthcare facilities and services, including sanitation and hygiene practices necessary for public health. Qualitative method was employed to gather in the depth of the data. The human security framework viewed health security as the critical aspect of human security, encompassing access to safe water, adequate nutrition and healthcare services. Community resilience theory focuses on the ability of communities to adapt to and recover from adverse events such as natural disasters. The research was conducted in Rushinga District, specifically focusing on Mazoe Bridge ward 18. A sample of 80 respondents for questionnaires and 20 respondents for interviews was selected. The population included residents of Mazoe Bridge including healthcare officers, teachers and students. The findings show that that the primary causes of water scarcity are low rainfall, droughts, climate change and lack of water conservation. The impacts of water scarcity on health security in Rushinga District are increase risk of waterborne diseases, diarrhea, malnutrition, lack of hygiene and sanitation etc. There is need for policy and government improvement, advocating for local authorities to priorities water security in their policies and resource allocation decisions.

DECLARATION FORM

I Vanessa Vimbai Mungofa (B211088B), do solemnly declare that this research study herein, is my own work and has not been copied from any source without the acknowledgement of the source.



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Students' signature

SUPERVISOR'S NAME: Dr C Muchemwa

Supervisors' signature

CHAIRPERSON'S NAME:

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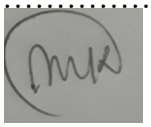
Chairperson's signature 

Date……14/10/2025……

DEDICATION

This research is dedicated to the Almighty, in gratitude for the opportunity and strength to pursue this endeavor. I also dedicate this work to my mother with deepest love and appreciation for her endless support and unwavering belief in me. Lastly to my family members for their constant support and encouragement.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Dr. Muchemwa, my supervisor for his invaluable guidance and insightful feedback throughout this research. I would also like to extend my gratitude to my precious mother Mrs. Mungofa, family and friends for their constant love, sacrifices and unwavering belief in me. I owe you everything.

Above all, I express my utmost gratitude to the Lord Almighty for providing me with the opportunity to pursue this research. The studies challenged me intellectually and required a lot of focus and discipline, but the supernatural comfort and protection from the Lord Almighty has seen me through.

LIST OF ABBREVIATIONS

APA	American Psychological Association
FAO	Food Aid Organization
MoHCC	Ministry of Health and Child Care
NIH	National Institute of Health
NGOs	Non-Governmental Organizations
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programs
UN	United Nations
WASH	Water Sanitation and Hygiene
WHH	Welt Hunger Hilfe
WHO	World Health Organization
ZIMSTAT	Zimbabwe National Statistic Agency

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Water scarcity is a growing concern across the globe as human population increase and the finite resource becomes stretched. Access to clean water and good sanitation is a fundamental human right and essential for human health, dignity and well-being. It is essential for healthy ecosystems and societies, yet is becoming increasingly more contaminated and scarcer. At least 780 million people live without clean drinking water and approximately 2.2 billion without access to improved sanitation (World Health Organization, 2019. Safer water, better health) Lack of access to these human rights is a major cause of diarrheal disease, which annually kills approximately 760,000 children under the age of five (WHO, 2019).

As a continent, the water scarcity situation in Africa is a pressing concern, with significant impacts for human health and environmental sustainability. The horn of Africa is facing its worst drought in 40 years, according to the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) (2020), 8.5 million people are affected by these droughts including 4.2 million children, who urgently need water and food assistance. Water scarcity affects 25 countries in Africa, with 12 experiencing severe scarcity (African Development Bank, 2020). Sanitation coverage varies widely across Africa, with some countries having less than 10% coverage (WHO/UNICEF, 2020). In urban Africa water scarcity leads to waterborne diseases like cholera, typhoid and diarrhea. This has significant chronic health implications and malnutrition Cairncross et al. (2014). Hygiene practices are also a concern, with only 19% of the population practicing handwashing with soap (WHO/UNICEF, 2020).

The regional water scarcity situation in Africa varies widely, with some countries facing more significant challenges than others Few et al. (2017). Water scarcity affects various regions

in Africa, with Eastern Africa being particularly vulnerable. Ethiopia, Kenya, Somalia, and Tanzania face droughts, displacements, and waterborne diseases. Southern Africa, including South Africa, Zimbabwe, and Mozambique, struggles with inadequate infrastructure and climate-related disasters. West Africa, notably Nigeria and Ghana, faces water scarcity due to population growth and urbanization. Central Africa, particularly the Democratic Republic of Congo and Cameroon, suffers from widespread waterborne diseases. North Africa, including Egypt and Morocco, confronts water pollution and scarcity Mukherjee et al. (2019).

In Zimbabwe, water scarcity is a pervasive issue, particularly in rural area like Rushinga District, Mash Central province. Water scarcity poses significant threats to health security in Rushinga District, Zimbabwe, where 80% of the population lacks access to improved water sources and only 44% have access to improved sanitation facilities (WHO, 2018). Climate change, droughts, and inadequate infrastructure exacerbate this crisis, leading to outbreaks of waterborne diseases such as cholera, typhoid, and diarrhea, particularly during rainy seasons. Malnutrition affects 25% of children under 5, while livestock deaths impact livelihoods and food security. The economic burden of water scarcity is also substantial, affecting agricultural productivity and perpetuating poverty.

Mazoe bridge ward 18 in Rushinga district was selected as a case study to provide a detailed assessment of the effects of water scarcity on health security among rural areas in a specific local context. The region experiences periodic droughts and inadequate rainfall, which severely limit the availability of fresh water. This scarcity affects both drinking water supplies and agricultural processes, leading to health insecurity and malnutrition among the local population. The reliance water sources exacerbate the situation, making it difficult for residents to secure consistent access to safe water. People in Mazoe bridge fetch water from boreholes, rivers and dams but the sustainability of water from these water sources is a challenge due to very high temperatures. The total population of ward 18 is 4. 526 (ZIMSTAT, 2022) and few

water sources with clean water people end up fetching unsafe water from the dam and rivers hence a threat to health security.

1.2 Statement of the problem

Despite efforts to improve access to clean water, Rushinga District in Zimbabwe continues to experience severe water scarcity, compromising the health security of its residents, particularly vulnerable populations such as children and women. The district's reliance on rain-fed water sources, inadequate water treatment and distribution infrastructure, and climate change induced droughts have led to recurring outbreaks of waterborne diseases, malnutrition, and economic hardship. The lack of effective water management strategies and coordination among stakeholders exacerbates the crisis, threatening the well-being and livelihoods of the district's inhabitants. There is a total population of 4.526 and only 2 dams, 10 boreholes and 9 deep wells to cater for the whole ward (ZIMSTAT, 2022). According to the World Health Programme the standard a borehole serves 300 people and some of the boreholes produces little amounts if water due to high temperatures and in summer some of the wells dry up. People, livestock and agricultural purposes relies on the dams and boreholes giving rise to water shortages and over extraction of groundwater due to the increased competition for water.

1.3 Purpose of the study

This study seeks to assess the effects of water scarcity on human security in Rushinga District. A case study of ward 18 (Mazoe Bridge).

1.4 Research Objectives

1. To investigate the causes and consequences of water scarcity on health security in Rushinga District.
2. To assess the effectiveness of existing water management strategies and policies

3. To evaluate how water scarcity impacts access to healthcare facilities and services, including sanitation and hygiene practices necessary for public health

1.5 Research questions

1. What are the primary causes of water scarcity and their impact on health security in Rushinga District?
2. What are the existing water management strategies and policies in place?
3. How does water scarcity influence access to healthcare services and sanitation facilities in Mazoe Bridge?

1.6 Assumptions of the study

This study assumes that Mazoe Bridge experiences significant water scarcity that negatively impacts health outcomes, particularly for vulnerable groups like children and the elderly.it suggests a link between limited access to clean water and increased rates of waterborne diseases and malnutrition. Additionally, the research assumes that residents are aware of these health risks associated with water scarcity and engaged coping mechanisms or adaption strategies. Also, the study assumes that the data collected and health records will be reliable and accurately reflect the conditions and experiences of the community. These findings can inform local policies aimed at improving water management and health security.

1.7 Significance of the study

The significance of this study on the relationship between water scarcity and health security in Mazoe Bridge is lies in its ability to shed light on how insufficient water supply negatively impacts health, especially for vulnerable groups like children and the elderly. By identifying the health consequences linked to water scarcity, the research can guide local policymakers in recognizing the critical need for better water management practices, as effective governance of water resources is vital for protecting public health and ensuring access to safe drinking water

(Miller et al., 2021). Additionally, the study seeks to enhance community resilience by examining the coping strategies used by residents, which is essential for adapting to persistent water challenges intensified by climate change (Anand, 2020). Ultimately, the findings will contribute to the wider conversation on water security and health, offering practical insights that can improve health outcomes and support sustainable development in the region (Anand, 2020).

1.8 Delimitations of the study

The study will focus on Mazoe Bridge, examining the effects of water scarcity on health security over the past five years (2019-2024). Vulnerable populations such as children and the elderly will be the targeted groups and investigating specific health indicators like waterborne diseases and malnutrition, leaving out unrelated health issues. The research will also analyse the various water sources access such as boreholes, wells and rivers using qualitative methods like interviews and focus groups. Stakeholder engagement will involve local health officials and community leaders. ethical considerations will centre on consent and confidentiality without addressing wider policy implications.

1.9 Limitations of the study

This study faces a number of limitations as it only focuses on Mazoe Bridge that may restrict the generalizability of the findings to other regions with different socio-economic and environmental contexts. The reliance on qualitative methods may leads to subjective bias. Additionally, the study will primarily address specific health indicators linked to water scarcity and leaving out other relevant health issues. The engagement of a specific group of stakeholders may not fully capture the broader community’s perspective affecting the comprehensiveness of the findings.

1.10 Definition of keywords

Water scarcity: The lack of sufficient available water resources to meet the demands of water usage within a region (WHO,2017). It can be categorized by into physical scarcity and economic, impacting both supply and access to water.

Human security: Is a concept that shifts the focus from national security to the protection of individuals and communities, emphasizing their rights and dignity in various dimensions, including health, economic and environmental security (UNDP,2014)

Health security: The protection if population from threats to health, including disease outbreaks and the unavailability of essential health services (Lee, 2015). It encompasses access to clean water, sanitation and healthcare services ensuring the wellbeing of individuals.

Waterborne disease: these are infections caused by pathogenic microorganisms that are transmitted through contaminated water sources leading to significant morbidity and mortality particularly in developing countries (WHO,2017).

Vulnerable populations: These are groups that face a higher risk of adverse health outcomes due to factors such as age, gender, socioeconomic status, or pre-existing health conditions (Berkman et al, 2016)

1.11 Dissertation Outline

CHAPTER 1: Introduction

This chapter provides an overview of the research topic, including the background information, research objectives, questions, assumption of the study, statement of the problem and significance of the study to get the scope and limitations of the study.

CHAPTER 2: Literature Review and Theoretical Framework

This section explains the existing literature of water scarcity and human security, the effects of water scarcity in Rushinga District and Mazoe Bridge to be specific. The chapter also aims in highlighting gaps in the literature and address them.

CHAPTER 3: Research Methodology and Design

This chapter explores the research design, data collection methods, sampling techniques and all the analysis procedures being used in the study. The ethical considerations and strategies for ensuring the validity and reliability are also discussed.

CHAPTER 4: Data Presentation, Results and Discussion

This chapter present the information found and analysis of the findings. The results will be discussed in relation to the research questions and existing literature highlighting key patterns and themes.

CHAPTER 5: Conclusions, Recommendations and Areas for Further Researches

This chapter is the summary of the research findings and offers recommendations and conclusion of the study based on results. it also outlines areas for further researches and implications for policy making and practices.

CHAPTER TWO

2.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

Water scarcity is a significant global issue that affects many aspects of human security, especially health security. As the demand for clean water rises due to population growth and climate change, access to safe water is increasingly at risk. The existing literature on the impact of water scarcity on health security is extensive but often scattered covering areas like environmental science, public health, and policy. This chapter will review key research findings, identify themes and gaps, and highlight how water management affects health. This chapter will also establish a theoretical framework based on the Human Security Framework, which focuses on protecting individuals from various threats, including those posed by water scarcity. This framework will help analyse the research findings and understand how water shortages impact health outcomes. Overall, this literature review and theoretical framework will set the stage for the analysis, illustrating the relationship between water scarcity and health security, and informing policies that support resilience in affected communities.

2.2 Theoretical framework

2.2.1 Human Security Framework

This study employs the human security framework to analyze the effects of water scarcity on health security in Mazoe Bridge. The human security framework emphasizes the protection of individuals from various forms of insecurity, including health threats arising from environmental factors such as water scarcity. This framework allows for a comprehensive understanding of how water scarcity impacts health outcomes and highlights the interconnectedness of water management, health, and community resilience.

2.2.2 Health security as a component of human security

Health security is a critical aspect of human security, encompassing access to safe water, adequate nutrition and healthcare services. The human security framework posits that threats to health security can arise from environmental degradation, including water scarcity. By applying this framework, the study aims to illustrate how water scarcity in Mazoe Bridge undermines health security and contributes to broader human security challenges.

2.2.3 Interconnectedness of Water, Health, and Community Resilience

The theoretical framework also emphasizes the interconnectedness of water resources, health outcomes, and community resilience. Effective water management practices can enhance community resilience, thereby improving health security. This perspective aligns with the findings of Gerlak et al. (2018), who advocate for integrated approaches that consider health and water policies in tandem.

2.2.4 Community Resilience Theory

Community resilience theory focuses on the ability of communities to adapt to and recover from adverse events, such as natural disasters or resource shortages. It emphasizes social cohesion, resourcefulness and the capacity to learn from experiences. This theory will inform the research on how communities in Rushinga District respond to water scarcity and what factors enhance their resilience. Understanding community strengths and adaptive strategies will be crucial for developing effective interventions. This perspective emphasizes the importance of social capital, adaptive capacity and resourcefulness in enabling communities to cope with limited water resources and associated health risks (Adger, 2000). Furthermore, research highlights that strong community bonds, equitable resource distribution and participatory governance structures are crucial for fostering resilience to water scarcity and mitigating its negative impacts on public health (Berkes, 2007). Ultimately, building

community resilience to water scarcity requires a holistic approach that integrates social, economic and environmental considerations to ensure sustainable access to water and protect community health Norris et al. (2008).

2.3 Water Scarcity and Health Outcomes

Water scarcity directly impacts health outcomes by increasing the prevalence of waterborne diseases. In Mazoe Bridge, limited access to clean water has led to a rise in diseases such as cholera and dysentery. Moyo et al. (2020) found that households in the region reported high incidences of diarrhea, particularly among children under five years old, due to reliance on contaminated water sources. This aligns with the World Health Organization (WHO) (2014), which emphasizes that inadequate water supply and sanitation are significant contributors to infectious diseases.

2.3.1 Waterborne Diseases

A primary health concern associated with water scarcity is the increased incidence of waterborne diseases. Limited access to clean water often forces communities to rely on unsafe sources, leading to outbreaks of illnesses such as cholera, dysentery, and typhoid fever. For instance, the Ministry of Health and Child Care (MoHCC, 2024) reported in Rushinga District, Zimbabwe, finding that households with inadequate access to safe drinking water reported significantly higher rates of diarrhoea, especially among children under five years old. This finding aligns with the World Health Organization (WHO, 2014), which indicates that inadequate water supply and sanitation are major contributors to the global burden of infectious diseases. Furthermore, a systematic review by Pandey et al. (2019) emphasizes that regions experiencing severe water scarcity tend to have higher rates of waterborne diseases. The authors highlight that poor sanitation and hygiene practices, exacerbated by water scarcity, significantly elevate health risks. Their findings underscore the need for improved water management and sanitation facilities to mitigate these health threats.

2.3.2 Nutritional Impacts

Water scarcity also indirectly affects health by impacting nutrition. Water is essential for agricultural production, and its scarcity can lead to reduced crop yields and food insecurity. Chikozho (2019) notes that in rural areas like Mazoe Bridge, declining water availability has led to lower agricultural output, directly influencing food security and nutritional status. This is particularly concerning for vulnerable groups such as children, the elderly and pregnant women who are at greater risk of malnutrition and its associated health complications Nyakudya et al. (2021). The cyclical relationship between food and water insecurity is well documented. Staddon et al. (2020) argue that food insecurity often coexists with water scarcity, creating a vicious cycle that exacerbates health vulnerabilities. Their research indicates that households facing both food and water insecurity experience higher rates of malnutrition and related health issues, emphasizing the importance of integrated approaches to address these interconnected challenges.

2.3.4 Mental Health Implications

The psychological effects of water scarcity are increasingly recognized as a significant aspect of overall health outcomes. Chronic water shortages can lead to heightened levels of stress and anxiety within communities. Kumar et al. (2020) found that individuals in areas with persistent water scarcity often experience increased mental health challenges, including anxiety and depression. The competition for limited water resources can exacerbate these tensions, leading to social conflict and further undermining community cohesion. Research by Karp et al. (2021) highlights those farmers who faces water scarcity experience significant stress related to crop failures and economic instability, which can lead to long-term mental health issues. These findings underscore the need for mental health support in communities affected by water scarcity, as the psychological toll can hinder individuals' ability to cope with other health challenges.

2.4 Gaps in the literature

2.4.1 Geographical Focus

Many studies on water scarcity tend to concentrate on specific regions, often neglecting the broader global context. For instance, research primarily conducted in urban settings may overlook the unique challenges faced by rural communities, leading to a skewed understanding of water scarcity's impacts across different environments. This geographical bias limits the applicability of findings to other contexts and may result in a lack of understanding of localized issues.

2.4.2 Interdisciplinary Gaps

Water scarcity intersects with various disciplines, including environmental science, public health, sociology, and economics. However, much of the existing research remains siloed within these fields. This lack of interdisciplinary collaboration can lead to incomplete analyses that fail to consider the multifaceted nature of water scarcity and its impacts on human and health security. Integrated frameworks that combine insights from multiple disciplines are often lacking.

2.4.3 Neglect of Psychosocial Impacts

Although there is growing recognition of the mental health implications of water scarcity, many studies still focus predominantly on physical health outcomes. The psychosocial effects including anxiety, stress, and social conflict are often underexplored. This oversight limits the understanding of the full range of impacts that water scarcity has on human security.

2.4.4 Inadequate Policy Analysis

Research frequently identifies the need for effective policies to address water scarcity but often lacks in-depth analyses of existing policies and their effectiveness. There is a need for critical evaluations of water management strategies, governance structures, and policy

frameworks to understand their role in mitigating the impacts of water scarcity on human and health security.

2.5 Strategies to overcome the limitations

2.5.1 Enhancing Interdisciplinary Collaboration

Past research has benefited from insights across various fields, including environmental science, public health, and sociology. Encourage interdisciplinary research teams that integrate diverse expertise. This approach can foster comprehensive analyses that consider the multifaceted nature of water scarcity and its impacts. Collaborative frameworks can be established to facilitate knowledge sharing and joint studies that address water scarcity from multiple perspectives Gerlak et al. (2018).

2.5.2Addressing Psychosocial Impacts

There is increasing recognition of the importance of mental health in the context of environmental stressors. Expand research to thoroughly investigate the psychosocial effects of water scarcity. Incorporating mental health assessments into studies can provide a holistic view of health outcomes and inform support systems for affected individuals Kumar et al. (2020).

2.5.3 Conducting In-Depth Policy Analyses

Identifying the need for effective policies has been a consistent theme in past research. Focus on detailed policy evaluations that assess the effectiveness of existing water management and governance frameworks. Comparative studies across different regions can highlight best practices and inform the development of more effective policies tailored to local contexts Staddon et al. (2020).

2.6 Potential Outcomes of Research on Water Scarcity and Their Importance

Research on water scarcity, particularly in contexts like Rushinga District in Zimbabwe, can yield several important outcomes that have significant implications for human and health security these potential outcomes include, improved understanding of health impacts that leads to enhanced knowledge of how water scarcity contributes to health issues, including waterborne diseases, malnutrition, and mental health disorders. This understanding can inform targeted public health interventions and policies. By identifying specific health risks associated with water scarcity, stakeholders can develop strategies to mitigate these risks, improving overall community health and resilience Moyo et al. (2020). Development of sustainable water management practices is another outcome that supports the identification of effective water management strategies that communities can adopt, such as rainwater harvesting, water conservation techniques, and sustainable agricultural practices. This is assumed to be important as sustainable practices are crucial for ensuring long-term water availability and mitigating the impacts of climate change. By promoting these practices, communities can enhance their resilience to water scarcity, leading to improved food security and economic stability (Chikozho, 2019). Furthermore, enhanced policy frameworks that provides evidence-based recommendations for policymakers to reform water governance and management systems. Its importance is that effective policies can lead to better resource allocation and management, ensuring equitable access to water for all community members. By addressing governance issues, research can help reduce conflicts over water resources and promote social cohesion Gerlak et al. (2018).

In addition, empowerment of vulnerable populations shows an outcome of increased inclusion of marginalized groups, such as women and children, in water management decisions and research processes. It is important in the sense that empowering these populations ensures that their voices are heard and that their specific needs are addressed. This inclusivity can lead

to more equitable outcomes and enhance the overall effectiveness of water management strategies. Another outcome is informed mental health interventions that is the recognition and understanding of the psychosocial impacts of water scarcity, leading to the development of mental health support systems. Addressing mental health issues related to water scarcity is essential for holistic community well-being. By integrating mental health considerations into water management and public health strategies, communities can better cope with the stress and anxiety caused by resource scarcity Kumar et al. (2020).

2.7 Key Assumptions on Water Scarcity

When conducting a research project on water scarcity, particularly in contexts like Rushinga District, Zimbabwe, several key assumptions underlie the study's design, methodology, and expected outcomes. These assumptions help frame the research questions and guide the investigation. Firstly, water scarcity is a multifaceted issue that assumes that water scarcity is not solely a physical lack of water but is influenced by various factors, including environmental, social, economic, and political dimensions. The research will consider a holistic approach, examining how these interconnected factors contribute to water scarcity and its impacts on human and health security. Also, local communities have valuable knowledge that explore that local communities possess critical knowledge and insights about their water resources, management practices, and the impacts of water scarcity. This imply that the research will prioritize participatory methods, engaging community members in data collection and analysis to ensure that their perspectives are reflected in the findings. Health outcomes are directly linked to water access is another assumption, there is a direct relationship between access to clean water and health outcomes, including the prevalence of waterborne diseases and overall community health. The study will focus on health indicators related to water access, aiming to quantify the impacts of water scarcity on specific health outcomes.

Additionally, interventions can improve outcomes. Implementing targeted interventions based on research findings can lead to improved water management and health outcomes for affected communities. The study will aim to identify best practices and successful interventions that can be promoted or scaled up in the context of water scarcity. Climate change exacerbates water scarcity, climate change is a significant factor that exacerbates water scarcity through altered precipitation patterns and increased evaporation rates. The research will consider climate data and projections as part of the analysis, assessing how changing climate conditions impact water availability. Community resilience can be enhanced, communities possess the capacity for resilience and adaptation in the face of water scarcity, which can be strengthened through targeted support and resources. The research will explore community-led initiatives and adaptive strategies, aiming to identify ways to bolster resilience to water scarcity. Lastly, vulnerable populations are disproportionately affected that are women, children, and marginalized groups are more severely impacted by water scarcity due to existing social inequalities. The research will seek to understand the specific challenges faced by these groups and will strive to ensure their voices are included in the research process.

2.8 Chapter Summary

The chapter on literature review and theoretical framework explores the complex issue of water scarcity, highlighting its profound effects on health, economic stability, and community resilience. It synthesizes existing studies that connect water scarcity with heightened health risks, especially among vulnerable groups. The chapter points out deficiencies in governance and policy approaches, recommending participatory models that involve local communities in decision-making processes. Theoretical framework has two theories, human security theory and community resilience theory inform the research, emphasizing the interconnected nature of water management, health, and socio-economic dynamics. Overall, this chapter lays the groundwork for further exploration into localized effects and adaptive strategies to improve

resilience in areas facing water scarcity.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

This chapter presents the research methodology and design necessary for the studying the effects of water scarcity on human security especially the aspect of health security in rural areas, Mazoe Bridge located in Rushinga district. The researcher employed mixed methods approach, integrating both qualitative and quantitative data collecting methods providing a comprehensive view on the nexus between water scarcity and health issues. The design aimed to provide both statistical trends and personal experiences giving a clear picture of the study. This chapter also outline the research philosophy, data collection instruments, sampling methods and population targeted to explore the study. Through this methodology, the researcher aims to inform the validity of the study and the ethical consideration to enhance the understanding of this critical topic.

3.2 Research Philosophy

This refers to the underlying beliefs that provide guidance to the process of the research, influencing ways of perceiving knowledge and how data will be integrated. In the context of this study on the effects of water scarcity on human security,

3.2.1 Pragmatism

Pragmatism approach advocates for a practical with solutions perspective that combines different methodologies to address complex issues. As this research topic water scarcity and health security is a multifaceted one, this study will employ a mixed methods design. Combining qualitative and qualitative data insights, the research aims to provide a broader view of how water scarcity affects health in rural Zimbabwe using Mazoe bridge as a specific area of study. Recent literature underscores the effectiveness of such approaches in informing

community-based interventions and policy development, allowing for tailored strategies that address the issue.

3.3 Research Approach

This dissertation investigates the effects of water scarcity on health security in Make Bridge Ward 18 of Rushinga District, where limited access to clean water poses significant public health challenges. Water scarcity has been linked to increased incidence of waterborne diseases, which disproportionately affect vulnerable populations, particularly in regions facing systemic inequities Mastrorillo et al. (2016). By employing a mixed-methods approach, the study combines quantitative surveys and qualitative interviews to assess water availability, health outcomes, and community perceptions. The research aims to identify correlations between water scarcity and the prevalence of waterborne diseases, ultimately providing insights and recommendations for policy interventions that can enhance health security in this vulnerable community. The findings will contribute to understanding how climate-induced changes in water availability impact health, as approximately half of the global population experiences severe water scarcity at some point each year, leading to significant health risks (UN, 2020).

3.4 Research Design

The research design for this dissertation utilizes a case study approach to explore the effects of water scarcity on health security in Rushinga District, specifically ward 18. This method involves an in-depth examination of the specific context, allowing for a detailed analysis of how water scarcity impacts health outcomes within this particular community (Yin, 2014). Data will be collected through structured surveys of households to quantify water access and health indicators, complemented by qualitative methods, including interviews and focus group discussions with residents and local health officials Creswell & Poth. (2017). This multifaceted

approach enables a comprehensive understanding of the unique challenges faced by the community, providing rich insights into the interplay between water scarcity and health security in a localized setting.

3.5 Population and Sample

The population for this study will consists of residents of Rushinga, specifically focusing on ward 18 area. This district is characterized by significant water scarcity issues which directly impact the health security of the community members. The population is diverse encompassing various demographic groups including age ranges, genders and socioeconomic statuses.

A target sample size of approximately 80 households will be set for the quantitative survey, which will allow for a robust analysis of health indicators and water access patterns. For the qualitative component, 20 participants will be selected for interviews ensuring a diverse representation of experiences regarding water scarcity.

3.6 Sampling methods to be used

Purposive sampling will be employed to select participants based on specific characteristics relevant to the study. This sampling method target individuals who have directly experienced water scarcity, such as residents relying on limited or contaminated water sources. It also promotes the inclusion of diverse demographic groups that are age, gender, socioeconomic status to capture a wide range of experiences. This method is particularly useful for qualitative research as it focuses on obtaining rich and detailed data from those most knowledgeable about the issue (Patton, 2015).

Simple random sampling will also be employed that involves selecting participants randomly from the entire population, ensuring that each individual has an equal chance of being chosen. This sampling method is applied using household lists from local authorities to create

a sampling frame and randomly select participants from this list. This method can be applied to the quantitative component of the study to ensure statistical validity. Simple random sampling minimizes bias and allows for statistical generalization of the findings to the broader population (Fowler, 2014).

3.7 Data collection methods

In this study of the effects of water scarcity on health security in Rushinga District, a combination of primary and secondary data collection methods will be utilized to gather comprehensive and relevant information.

3.7.1Primary Data Collection Methods.

a. Surveys

Structured questionnaires will be administered to gather quantitative data on health indicators, water access, and demographic information from a representative sample of household. Surveys will include questions about:

- Frequency and quality of water access
- Incidence of waterborne diseases
- Healthcare utilization patterns

Surveys allow for the collection of standardized data from a large population, facilitating statistical analysis and generalizability of findings (Fowler, 2014).

b. Interviews

Semi-structured interviews will be conducted with key stakeholders, such as local health officials, community leaders, and residents. The interviews will explore personal experiences and perceptions regarding water scarcity and health security, allowing for in-depth qualitative

insights. This method provides rich and detailed information and helps uncover nuanced perspectives that surveys may not capture (Kvale & Brinkmann, 2009).

3.7.2Secondary/Data Documentary Collection Methods

a. Document Analysis

Review of existing reports, studies, and documents related to water scarcity and health in Rushinga District, specifically Mazoe Bridge. These sources may include:

- Government reports on water supply and health statistics
- Research studies from NGOs and academic institutions
- Policy documents regarding water management and health interventions

Document analysis provides context and background information, helping to identify trends and gaps in existing research (Bowen, 2009).

b. Health Records

Analysis of secondary health data from local health facilities and government database. This may involve examining records of waterborne diseases, hospital admissions, and health service utilization rates over a specified period. Health records offer quantitative data that can highlight the impact of water scarcity on community health and provide evidence for correlations identified in primary data collection (Murray & Lopez, 2013).

3.8 Validity and Reliability

To ensure validity and reliability in this study on water scarcity and health security in Rushinga District, specifically ward 18, a multifaceted approach will be employed. Content validity will be achieved through the development of questionnaires based on established

literature and expert reviews (DeVellis, 2016). Construct validity will be supported by designing qualitative interviews that explore and reflect living conditions in Mazoe Bridge (Creswell & Poth, 2017).

Reliability will be ensured by pilot testing the questionnaires, employing similar set of questions for qualitative data collection to confirm reliability, and conducting test-retest assessments for stability (Yin, 2014). These strategies will enhance the credibility of the research findings.

3.9 Data Presentation and Analysis

Data presentation and analysis will involve both quantitative and qualitative methods. Quantitative data from the structured questionnaires will be analyzed using statistical techniques to identify trends, correlations, and significant relationships between water scarcity and health outcomes (Field, 2013). This data will be presented through descriptive statistics, such as means and percentages (Pallant, 2016). Qualitative data from interviews will be thematically analyzed to extract key insights and patterns related to personal experiences and perceptions of water scarcity (Braun & Clarke, 2006). The integration of these methods will provide a comprehensive understanding of the impacts of water scarcity on health security in the community.

3.10 Pilot Testing

Pretesting the questionnaire is a crucial step in the research process that involves administering the questionnaire to a small group of participants to test its validity, reliability, and usability. The pretesting process helps to identify any errors, ambiguities, or inconsistencies in the questionnaire, which can be corrected before the main study. The

pretesting of the questionnaire will be conducted as the questionnaire will be administered to 10 participants. The results of the pretesting are presented as follows

- The records of the response that will be recorded from the 10 participants that will be administered the questionnaire.
- The participants should respond to the questionnaire being easy and easy to understand
- Did the participants report that the questionnaire was relevant and covered all the necessary topics?
- Did the participants report that the questionnaire was not too long or too short?

3.11 Ethical Considerations

The study's collection of data from participants raises several ethical considerations. Informed consent, confidentiality, and anonymity are ensured through a clear explanation of the study, the use of code numbers, and secure data storage (American Psychological Association, 2020). Participants' autonomy is respected, and they can withdraw from the study without penalty (World Health Organization, 2019). The study aims to contribute to the understanding of water scarcity's effects on health security in rural Zimbabwe, informing policy development and interventions (National Institutes of Health, 2020).

3.12 Chapter Summary

This chapter outlines the mixed methods approach used to investigate the effects of water scarcity on health security in Rushinga District. Employing a cross-sectional design, the study targets local residents through purposive sampling, aiming for a sample of approximately 80 households for quantitative surveys and 20-30 individuals for qualitative interviews and focus groups. Data collection includes primary methods (surveys and interviews) and secondary document analysis of health records, while data analysis involves both statistical techniques

for quantitative data and thematic analysis for qualitative insights. This comprehensive methodology aims to reveal the complex relationship between water scarcity and health outcomes, informing effective policy and intervention strategies.

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

This chapter aims to give a clear presentation, analysis and discussion of the research findings conducted in relation to the research objectives and the data obtained in the field. It sought to draw the connection between data collected relating it to the objectives of the study that are to investigate the causes and consequences of water scarcity on health security in Rushinga District, to assess the effectiveness of existing water management strategies and policies and to evaluate how water scarcity impacts access to healthcare facilities and services, including sanitation and hygiene practices necessary for public health.

4.1.1Response rate

Table 4.1.1 Questionnaires response rate

Expected responses	80
Actual responses	76
Spoiled responses	4
Response rate percentage	95%

The respond rate for the questionnaires was 95%. The research aimed to administer 80 questionnaires. Despite some challenges faced, the study managed to get a robust response rate of 95%.

Table 4.1.2 Interviews response rate

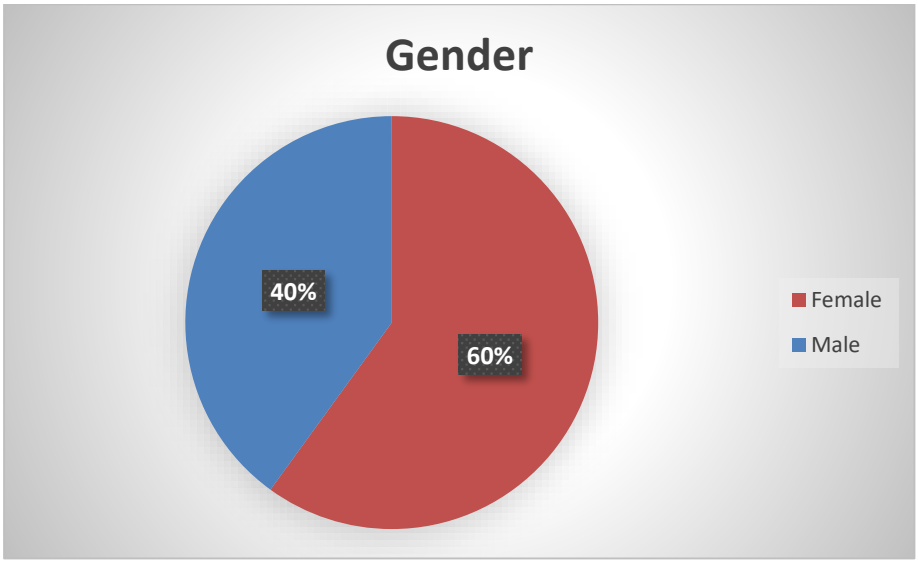
Targeted respondents	20

Actual respondents	17
Failed responses	3
Response rate percentage	85%

The response rate for the interviews was 75%.

4.2 The Demographic variables

4.2.1Gender

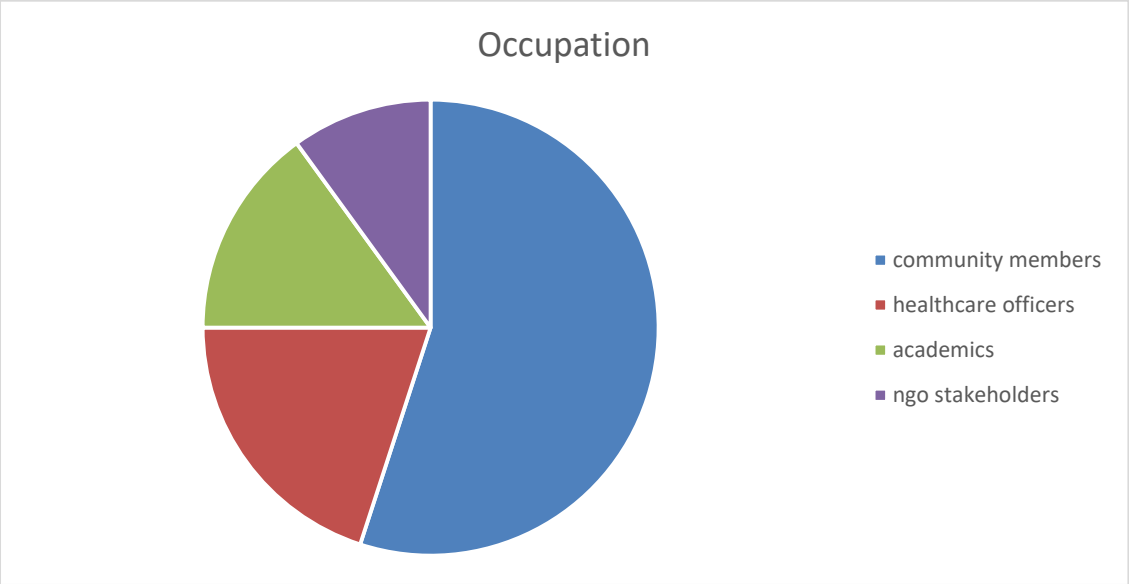


60% of the respondents were females and the rest 40% represents males.

4.2.2Age

Age group	**Number of people**
18-25	**15**
25-30	**25**
30-35	**15**
35-40	**25**
40-50	**10**

4.2.3Occupation



4.3 The effects of water scarcity on health security

The respondents were asked about their knowledge regarding health security and safe water sources access. There were various themes that the researcher got from their responses that includes:

a. I

ncrease risk of waterborne diseases

Participants suggested that water shortages among communities increase the rate of getting waterborne diseases like cholera. When communities lack access of treated water sources, they tend to use contaminated sources raising the incidents of cholera and hepatitis A Ghosh et al. (2021). Studies have shown that water scarcity reduces the ability of individuals to maintain proper hygiene and sanitation practices. A publication in The Lancet Infectious Diseases highlights that limited water availability leads to poor household hygiene, directly correlating with higher rates of diarrheal diseases Bartram et al. (2014). One of the respondents mentioned that;

" In my community, we often face water scarcity, especially during the dry season. I've seen firsthand how many families have to rely on unregulated water sources, which has led to outbreaks of diseases like cholera and dysentery. I believe access to safe drinking water is a fundamental right that we currently lack."

The above statement shows that community members in Mazoe Bridge faces a challenge in receiving low rainfall and tend to suffer safe water access during dry seasons which makes them rely on uncontaminated water sources. This threatens their health as there are numbers of members suffering from cholera, in some cases claiming lives. Another respondent said, *"Cholera remains a significant public health challenge in our community due to limited access to clean water and poor sanitation. Many families rely on contaminated water sources, leading to outbreaks that threaten lives, especially among children and the elderly*."

This statement clearly shows how cholera have been a major problem in the lives of the Mazoe bridge residents due to the failure of accessing clean water. In line with the above, the study noted that the incidents of waterborne diseases are directly correlated with the quality of drinking water. This is supported by the World Health Organization (WHO, 2017) which notes that the lack of reliable access to clean water exacerbates the community's vulnerability to waterborne diseases such as cholera highlighting a critical gap in health security.

b. Malnutrition

Water scarcity effects food production, reducing agricultural yields leading to food shortages. Malnutrition can lead to a plethora of health issues, particularly stunting and wasting among children. According to a study by Black et al. (2013), malnutrition significantly contributes to child morbidity and mortality, as it impairs the immune system, making children more susceptible to infections and diseases. Malnutrition predisposes individuals to chronic diseases later in life. According to the World Health Organization (2003), individuals who

experienced malnutrition in childhood are at higher risk for conditions such as obesity, diabetes, and cardiovascular diseases as they age. One of the responded shared that,

"As a member of Mazoe Bridge community I have observed firsthand the devastating impacts of water scarcity on our community's nutrition and overall health. Without reliable access to clean water, many families struggle to grow healthy food. The limited irrigation affects our agricultural yields this results in lack of essential crops that provide vital nutrients. Also, we are witnessing an alarming rise in malnutrition, particularly among our children and pregnant women, the stress of securing water daily takes a toll on our community's economic stability. When parents spend hours looking for water, they have less time to engage in productive work or skills development thus contributing to a cycle of poverty and malnutrition".

The above statement shows that malnutrition has become a challenge in the community of Mazoe Bridge due to water shortages. The researcher noted that water scarcity hinders the production of food and contribute to micronutrient deficiencies that affects the health of the population overall. Here's another statement from a responded from the clinic who shared said that,

"As a nurse working in Mazoe Bridge Ward 18, I estimate that approximately 150 children under the age of five and around 80 pregnant women suffer from malnutrition each year. This situation is exacerbated by water scarcity, which affects access to nutritious food and clean water, leading to increased health risks for these vulnerable groups".

This clearly shows that the vulnerable groups in Mazoe bridge are at danger of water shortages. This is also indicated by the United Nations International Children's Emergency Fund (UNICEF, 2020) which notes that water scarcity can limit agricultural productivity

affecting the availability of food and diversity. This leads to malnutrition, particularly among vulnerable populations such as children and pregnant women.

c. Mental health issues

Water scarcity significantly contributes to heightened stress and anxiety levels among individuals and families. The constant worry about accessing clean and sufficient water can create an ongoing psychological burden. Research indicates that disruptions in water supply led to increased anxiety and mental health challenges. For instance, a study by Mastrorillo et al. (2016) found that households facing water shortages often report elevated levels of chronic stress. This stress arises from various factor including the fear of not having enough water for daily needs, the physical strain of collecting water from distant sources and concerns about the health implications of using contaminated water. The psychological impact is particularly pronounced in vulnerable populations, such as women and children, who typically bear the responsibility for water collection. Their daily routines become dominated by the struggle for water that contributes to fatigue and heightened anxiety. Schröder et al, (2006) also highlight that water scarcity can exacerbate feelings of insecurity and helplessness, contributing to a decline in overall mental well-being. A female resident of Mazoe bridge shared,

" As a woman in Mazoe Bridge Ward 18, the constant struggle to find clean water has taken a toll on my mental health. Every day I worry about whether I will have enough water for my family's needs. The stress of having to walk long distances to collect water and the fear of using contaminated sources make me anxious all the time. It feels like there's no escape from this pressure and it affects not just me but my children too. The burden is overwhelming and I often feel powerless in this situation".

The study according to the above statement given by a respondent noted that water shortages in Mazoe Bridge is a major contributor to health implication in the community as it perpetuates

stress problems and high blood pressure. The psychological burden of dealing with resource shortages can exacerbate feelings of anxiety and depression (Fanzo et al., 2013). Another elderly female resident living alone also said,

" *Mvura inonetsa kuwana apa zvibhorani zvacho zvirikure dzimwe nguva ndinototumawo tuzukuru vana vechikoro kondicherera mvura dzimweni dzenguva vanoramba saka kana ndikaiwana mvura yacho ndeyekutoshandisa ishoma ishoma isakasire kupera, nguva yezhizha ndotoshandisa yemurukova nekuti ndoinenge iri padyo".* Translation "*Water is difficult to fetch and due to her old age, I struggle to walk long distance to get water, so most of the times I ask some school children to fetch water for me therefore, I learnt to ration the water for it to last and in the rainy season I tend to uses river water which will be easy to get yet extremely dangerous*".

The above statement shows the stress and struggle the residents of Mazoe Bridge faces in accessing clean water and the stress they bear in their everyday life. The researcher noted that the residents of Mazoe bridge are not even safe due to this water shortages as they sometimes use contaminated water from rivers and the stress associated with inadequate access to water can lead to a decline in mental health which affects individuals' ability to cope with the daily challenges.

d. Impact on hygiene and sanitation

Water scarcity significantly impacts sanitation and hygiene by limiting access to clean water, which is essential for maintaining proper hygiene practices. According to Bartram et al. (2014), when water is scarce, individuals may neglect handwashing and other sanitary routines, leading to an increased risk of waterborne diseases such as cholera and dysentery. Additionally, Lopez et al. (2019) highlight that inadequate water supply can hinder effective waste management, resulting in unsafe disposal methods like open defecation. This situation disproportionately

affects women and girls, as emphasized by Baker et al. (2014), who often bear the responsibility for household hygiene, further exacerbating health risks and limiting their opportunities for education and economic participation. The researcher approached a teacher at Mazoe bridge primary who said,

"As a teacher in Mazoe Bridge Ward 18, I see firsthand how water scarcity affects *our students' hygiene and health. Many children come to school without having washed their hands, which raises concerns about the spread of illnesses. The lack of clean water for drinking and sanitation facilities makes it difficult for us to maintain a healthy school environment, and this impacts their ability to focus on learning."*

Another respondent in the community a mother said,

"As a mother in this community, the struggle for clean water affects my family's hygiene every day. With limited water supply, my children often miss out on basic hygiene practices like bathing and handwashing. This not only worries me about their health but also makes it challenging for them to feel clean and comfortable. I fear that without better access to water, my children are at risk of falling ill and missing school".

This shows that due to the shortages of water residents cannot keep up the required hygiene and sanitation as they cannot afford to have extra water to clean toilets or wash their clothes and dishes properly hence poor hygiene and sanitation among the community. This helped the researcher to notes that insufficient water for sanitation compromises food safety practices such as washing fruits, vegetables and bathing thus leading to foodborne illness and contributing to feelings of shame. According to (WHO, 2017) it is indicated that inadequate water supply is a leading factor in the spread of infectious diseases due to poor hygiene practices.

e. Increased healthcare costs

Increased healthcare costs associated with water scarcity are a significant concern, driven primarily by the rise in waterborne diseases such as cholera and diarrhoea, which necessitate medical treatment and hospitalization (WHO, 2017). Households lacking reliable access to clean water often face higher out-of-pocket expenses for medical consultations, medications, and transportation to healthcare facilities (Hutton and Haller, 2004). Additionally, water scarcity can exacerbate chronic health conditions, leading to long-term healthcare costs as ongoing medical care becomes necessary Mastrorillo et al. (2016). Furthermore, local health systems may become strained as increased patient loads from preventable diseases divert resources, impacting the overall quality of care available Schmidt et al. (2017). Addressing water scarcity is therefore essential for improving public health outcomes and reducing the financial burdens on families and health system. A healthcare respondent shared that,

"As a healthcare worker in our community, I see the direct impact of water scarcity on our patients every day. The treatment costs add up quickly straining not only their finances but also our healthcare resources. Families often struggle to pay for medications and hospital visits, which puts them further into debt. It's disheartening to witness how something as basic as water can lead to such significant health issues and financial burdens."

The researcher went on to ask a male resident on their experience about healthcare costs due to water shortages and he said,

"Many families, including mine, struggle to keep up with the healthcare costs that come from diseases caused by unsafe water. When my children get sick from contaminated sources, we face huge bills for medications and doctor visits that we can barely afford. It's frustrating to know that if we had better access to clean water, we could prevent these illnesses and the financial strain that follows. Our community deserves better, and we need to advocate for solutions that address this critical issue."

The above statements show how healthcare costs are becoming a major issue in the day-to-day life of the residents and a problem in the healthcare facilities in Mazoe Bridge. Additionally in this area healthcare systems had overwhelmed by the increased demand for services related to preventable diseases. The study noted that this strain leads to higher operational costs for healthcare facilities. This is also supported by the Food and Agriculture Organization (FAO, 2019) the financial strain of securing water can lead to delayed medical care and increased vulnerability to health issues perpetuating cycle of poverty and poor health.

4.4 The effectiveness of existing water management strategies and policies

The response showed how the residents of Mazoe Bridge access clean drinking water, how they try in managing the existing water sources strategies and policies to archive health security. One of the participants indicated that,

"*…I have seen both the negative and positive aspects of our current water management strategies*. *While the installation of boreholes and piped systems has multiplied access to clean water, many remote areas remain underserved, forcing families to travel long distances for water. Additionally, the cost of accessing water can be unaffordable for others, leading to reliance on unsafe sources. Community involvement in decision-making is lacking, which hinders the effectiveness of these strategies. For a truly equitable solution, it's essential to engage local voices and ensure that infrastructure improvements reach all households, addressing both access and affordability."*

This statement aligns with view that effective water management strategies must prioritize equitable access and community involvement to address disparities in water availability. According to Bakker (2003), the unequal distribution of water resources often exacerbates existing social inequalities, particularly affecting marginalized groups. Engaging local communities in decision-making processes not only enhances the relevance of water

management initiatives but also ensures that infrastructure developments meet the specific needs of all residents, ultimately fostering sustainable and inclusive access to clean water. On this aspect the study noted that in Mazoe Bridge existing water management policies often focus on regulation rather than investment in infrastructure as there are insufficient funding and maintaining or upgrading water supply system that leads to persistent water scarcity. Local residents have reported that broken water points are not promptly repaired leading to frustration and increased reliance on unsafe water sources (FAO, 2019). Therefore, the study noted from the findings that the Mazoe Bridge residents are poor hence they cannot afford funds for the repairing of their damaged water points like boreholes as they end up relying on unsafe water sources.

4.4.1Sustainability

From the findings it was noted that sustainable water management practices, such as rainwater harvesting and efficient agricultural techniques, have been promoted locally. According to Molden et al. (2010), integrated approaches that consider local contexts can enhance sustainability. However, in Mazoe Bridge, the effectiveness of these practices is often limited by a lack of resources and technical support, which can undermine long-term sustainability efforts. Another participant indicated that,

"I believe that while our community in Mazoe Bridge has made strides toward sustainable water management, significant challenges remain. The introduction of rainwater harvesting and drought-resistant crops shows promise for enhancing resilience against climate variability. However, the lack of resources and technical support limits the effectiveness of these initiatives ".

The community members are putting efforts in sustainable water management practices such as constructing manmade dams and practicing sanitation practices and ending open

defecation with the help of NGOs like World Vision and Welt Hunger Hilfe (WHH). These efforts are somehow failing to help the whole community dues to lack of knowledge by the residents as they tend to refuse to engage in the processes. This is indicated by another participant who said, "…*many residents are unaware of sustainable practices, which hinders widespread adoption. For true sustainability, it is crucial to invest in education and provide the necessary tools and resources, ensuring that all community members can participate in and benefit from sustainable water management efforts."*

The study noted that the sustainable water management requires active participation from community members. From the findings the researcher also noted that engaging local populations in decision making is essential for relevant strategies and culturally appropriate. This is also supported by (WHO, 2017) which emphasizes that effective regulations can help maintain water quality and availability which ensures that resources are not depleted or contaminated.

4.4.2 Adaptability and Resilience

The community's resilience to water scarcity is increasingly important in the face of climate change. Hofstra et al, (2019) argue that adaptive management practices are essential for coping with variability in water availability. In Mazoe Bridge some strategies, such as promoting drought-resistant crops, have been beneficial but a more comprehensive approach is needed to effectively respond to environmental changes. As it has indicated by another participant,

"Our community in Mazoe Bridge has shown remarkable adaptability in the face of water management challenges. Initiatives such as the development of alternative water sources and the promotion of water conservation practices have strengthened our resilience. To enhance our adaptability, it's essential to foster a culture of innovation and collaboration which is encouraging us residents to share and implement new strategies. By building on our strengths

and addressing weaknesses, we can create a more resilient water management system that effectively responds to changing conditions."

This is supported by Pahl-Wostl, (2008) who indicates that community participation fosters a sense of ownership and responsibility which can lead to water related challenges. The study hence noted that the community members are willing to adapt to the challenge as they are engaging in new strategies to handle the situation and also changed their crops to drought resistant one like sorghum for food security. In line with the community resilience theory which propose the perspective that emphasizes the importance of social capital, adaptive capacity and resourcefulness in enabling communities to cope with limited water resources and associated health risks (Adger, 2000). However, the researcher noted that regardless all these efforts there are challenges that are being faced by the residents including inadequate funding, lack of technical expertise and political instability are hindering the effective implementation of adaptive strategies.

4.5 Impact of water scarcity on access to healthcare facilities and services

In Mazoe Bridge, water scarcity significantly impacts access to healthcare facilities and services as indicated by the findings. It has been evidenced that access to clean water is vital for maintaining hygiene in healthcare settings. In Mazoe Bridge, where water scarcity is prevalent, healthcare facilities struggle to ensure adequate sanitation, increasing the risk of healthcare-associated infections (WHO, 2017). This situation is particularly concerning in a region already burdened by health challenges. This is evidenced by the statement given by one of the participants at the clinic who said,

" *The limited access to clean water significantly hampers our ability to maintain proper sanitation practices in healthcare facilities. This situation not only increases the risk of healthcare-associated infections but also undermines the overall quality of care that patients*

receive. To protect our community's health, it is crucial that we prioritize reliable access to clean water and implement effective hygiene protocols. By doing so, we can enhance infection control measures, ultimately improving health outcomes and building a safer environment for all."

Healthcare facilities in water-scarce areas often face operational difficulties due to the need to source water from unreliable external sources Bakker et al. (2008). In Mazoe Bridge, this can lead to reduced service availability and longer waiting times, impacting the quality of care provided to patients. Bartram and Cairncross (2010) highlights a direct correlation between water scarcity and the prevalence of waterborne diseases. In Mazoe Bridge, limited access to clean water has been linked to higher rates of diseases such as cholera and dysentery, placing additional strain on local healthcare services. The study noted that in the surveys conducted in Mazoe Bridge, approximately 65% of healthcare facility managers reported experiencing operational difficulties due to the need to source water from unreliable external sources. Many facilities indicated that this reliance on inconsistent water supplies led to disruptions in service delivery, increased wait times for patients and challenges in maintaining essential hygiene practices. The lack of a stable water source not only strains our resources but also compromises the quality of care we can provide, highlighting the urgent need for sustainable water solutions in our community.

Hutton and Bartram (2008) found that families in water-scarce regions often face economic challenges that hinder their access to healthcare. In Mazoe Bridge, the costs associated with obtaining water or traveling to healthcare facilities can deter residents from seeking necessary medical care, exacerbating health issues as noted from the findings. Mastrorillo et al. (2016) emphasize that water scarcity can severely limit healthcare facilities' capacity to respond effectively to emergencies. In Mazoe Bridge, this limitation can lead to poor health outcomes during crises, particularly for vulnerable populations. Another respondent indicated that;

"We travel long distances seeking medical attention as our local clinic lacks some healthcare facilities, most of the times we fail to reach to the better nearest hospitals in times of emergency and that's a threat to our lives"

This information showed the study that the lack of clean water undermines hygiene, strains healthcare operations, increases the disease burden and creates economic barriers for residents. The study suggests that addressing these challenges is essential for improving healthcare access and overall public health in the community.

4.6 Impact of water scarcity on migration and displacement

Water scarcity is a significant driver of forced migration, particularly affecting vulnerable populations who lack the resources to adapt to diminishing water resources. Scholars like McLeman and Smit (2006) highlight that individuals and families may be compelled to leave their homes in search of reliable water sources, leading to rural-urban migration and increased pressures on urban infrastructure, as noted by Bettini (2014). This displacement often results in long-term challenges for migrants, including difficulties in integrating into new communities and limited access to employment and social services (Zickgraf, 2018). To mitigate these impacts, proactive policies focused on sustainable water management and community support are essential, as emphasized by Rigaud et al. (2018). One of the participants, the headman said regarding the migration and displacement:

"In our community, we have witnessed firsthand how water scarcity drives families to leave their homes in search of better living conditions. Many of those affected are vulnerable individuals who simply do not have the means to adapt to the worsening water situation. This has led to a noticeable increase in migration to urban areas, which in turn places immense pressure on local infrastructure and services. It is clear that without proactive policies focused on sustainable water management, we will continue to see cycles of displacement and vulnerability that adversely affect our entire community."

The above statement shows how water scarcity can impacts individuals badly leaving them with no option and they tend to live a difficult life wherever they go. The study noted that water is a necessity for a better human life. As people migrate, they leave behind their parents in the village who bear emotional toll alone. The departure of economically active individuals can create labour shortages, resulting in economic decline and reduced agricultural productivity as highlighted by McLeman and Smit (2006). The emotional impact is also profound as the family members left behind may experience feelings of abandonment and anxiety, which can affect community cohesion and mental health (Zickgraf, 2018). An elderly participant shared her grief as she said,

"Sagogo ndangosara ndega kudai vana vakatama vakaenda kutaundi kunitsvaga pekugara nekuda kwemvura shoma yekuno, ndakatodzidzira kuchengetedza mvura yangu ndoshandisa ishoma ishoma dzimwe nguva ndokumbirawo vazukuru kana vana vechikoro vanondichererawo apo neapo ndinongoshuwa vana vangu varipo tichifara nekudya tiri pamwe". She was saying that as an elderly woman I was left alone by my children going to the urban areas looking for better living conditions escaping this water shortage challenge I have learnt to ration water, most of the time I seek assistance from grandchildren in the village or school children I really wish if my children were around sharing the laughter and eating together.

Furthermore, the disruption of social networks weakens local support systems, making it more challenging for those remaining to advocate for resources and cope with the ongoing effects of water scarcity Black et al. (2011). As such the study noted that addressing the needs of both migrants and those who stay is crucial for building resilient communities.

4.7 Humanitarian assistance to vulnerable groups

From the findings the study noted that humanitarian assistance of vulnerable groups facing water scarcity is critical in mitigating the immediate impacts of this crisis and fostering long

term resilience.

4.7.1Water supply and distribution

Immediate access to clean and safe drinking water is paramount. Humanitarian efforts often involve the establishment of water distribution points, installation of water tanks, and the provision of water purification systems. Howard and Bartram (2003) highlights that ensuring access to potable water significantly reduces the risk of waterborne diseases. In Mazoe Bridge the World Vision is making significance effort in installing water tanks and provision of water purification systems in schools, clinic and communities. Another participant indicated this when she said,

"We are incredibly grateful to World Vision for installing water tanks and purification systems in our schools, communities and clinics. This vital support has provided us with access to clean and safe drinking water, significantly improving the health and well-being of our children and families. With these resources, our clinics can better serve patients, reducing the risk of waterborne diseases. Thanks to the World Vision, we can focus on education and community development knowing that we have reliable water resources to support our needs. The only problem is that we pray these initiatives reaches everyone in the area because there are some villages still living with difficulties."

The above statement shows how grateful and a relief these humanitarian assistances are providing to the community still to cover all areas. It is also in line with the view that ensuring access to clean water is crucial for preventing waterborne diseases and supporting overall public health (UN, 2010). The study noted from the findings that humanitarian efforts often face numerous challenges including logistical difficulties in reaching remote areas and limited resources for scaling up operations. Also, the political influence as the councilors or headmen chooses a place near to their homestead (not the center for all) to be put the water points disadvantaging others with no power influence.

4.7.2Sanitation and Hygiene (WASH) Programs

Alongside water supply, effective sanitation and hygiene practices are essential to prevent disease outbreaks. Humanitarian initiatives typically include constructing latrines, promoting hygiene education, and distributing hygiene kits that contain soap and other sanitary products. According to Fewtrell et al, (2005), WASH interventions can reduce the incidence of diarrheal diseases by up to 45%. In the context of Mazoe Bridge WASH programs have witnessed in carrying out the research though the stakeholders face denial from the community members. NGOs like WHH and World Vision are carrying out a very pleasant job in ensuring effective sanitation and hygiene practices. One of the respondents said;

"We would like to express our heartfelt gratitude to Welt Hunger Hilfe (WHH) and World Vision for their invaluable support in implementing WASH programs in ward. The sanitation facilities and hygiene education initiatives has made a significant difference in our community. Access to clean water and proper sanitation is essential for our health and well-being. Also, the training provided in hygiene practices has empowered our community members to take charge of their health and promote better sanitation standards. We appreciate the commitment of WHH in enhancing our living conditions and fostering a healthier environment for our families".

The study noted that initiatives of WASH programs by World Vision and WHH where community members are being educated and trained to build ventilated improved pit, dish sinks or pot racks, dig trash holes, water points (chigubhu gear) and well cleaned yards promoting sanitation and hygiene at homesteads. The intervention of NGOs led WASH programs has helped largely the residents of Mazoe Bridge on improved hygiene and sanitation as supported by the view of the WHO, (2020) that improving sanitation and hygiene can significantly reduce the incidence of diseases and enhance community health outcomes.

4.7.3Livelihood Support

Findings indicated that the government and Caritas are providing support in terms of livelihood and wellbeing assistance. Water scarcity directly affects agriculture and livelihoods. Humanitarian assistance often includes providing drought-resistant seeds, tools, and training in sustainable agricultural practices. Mastrorillo et al. (2016) note that supporting livelihoods helps communities adapt to changing water availability and promotes food security. They also provide with maize for consumption and CARITAS is helping by giving maize meal and porridge in schools. This is indicated by the respondent who said;

"We are grateful for the support in providing maize, seeds, and porridge to our schools and communities. This assistance has been vital in addressing food insecurity and ensuring that our children receive proper nutrition. The porridge served in schools not only helps nourish our children but also encourages attendance and concentration in classes. However, we recognize that challenges remain, particularly in securing consistent access to these resources"

The above statement can be supported by United Nations Development Programme (UNDP, 2020) which suggests that sustainable livelihood initiatives are essential for empowering communities, especially in the face of crises such as natural disasters. The study also noted from the findings that livelihood support is crucial for helping vulnerable communities improve their social stability and overall quality, witnessing how happy and grateful respondents were to the partners that are landing a hand to help them in times of crisis in reducing poverty and promoting food security.

4.7.4Health Services

Water scarcity can lead to health issues, particularly in vulnerable populations. Humanitarian assistance may include mobile health clinics to address water-related illnesses and ensure access to healthcare services. Toole and Waldman (1997) emphasize that integrating health services with water and sanitation programs can enhance overall community well-being.

In Mazoe Bridge the district health officers provide mobile facilities in wards in times of disease outbreak like cholera outbreak for example in 2023 cholera outbreak. Nurses and doctors were assigned to camp in wards and villages to provide emergency alerts to the community members (Health Report Rushinga district, 2024). One of the participants who had received help in time shared his gratitude saying;

"I would like to express my heartfelt gratitude for the mobile health services provided during the recent cholera outbreak. The mobile clinics brought essential medical care right to our community, making it accessible for those of us who were affected. The support I received not only helped me recover but also educated my family and neighbors about cholera prevention and treatment. I am thankful for the efforts of everyone involved in this initiative, and I hope that such services continue to be available to protect our community's health."

However, in as much as they try to help everyone in the communities there are some remote areas, they cannot reach disadvantaging other citizens. The study noted that the government is trying hard in helping and providing assistance to everyone.

4.8Chapter Summary

This chapter has focused on the presentation, analysis and discussion of the data that was collected and obtained from the field. It also aimed to answer the research questions that were highlighted in chapter one. This chapter has been structured using the order of the questions as the study shows the primary causes of water scarcity, the existing water management strategies and policies in place and how water scarcity influence the access of healthcare services and sanitation facilities in Mazoe Bridge.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

5.1 INTRODUCTION

This chapter seeks to summarize the findings from the research study and draw conclusions based on the research questions and objectives. Also, it aims to outline recommendations stemming from the findings of the research study. The study sought to assess the effects of water scarcity on human security focusing on the aspect of health in Rushinga District, specifically ward 18 Mazoe Bridge. Through the interviews and questionnaires carried out in the field with stakeholders, insights were gained regarding the understandings of health security, the effects and causes of water scarcity among communities and ways to encounter these impacts and how to sustainably keep the existing water supplies. Conclusions will be presented based on the causes and effects of water scarcity on health security in Mazoe Bridge, ways to encounter these impacts and common barriers being encountered in the process. Recommendations are put forth in regarding to enhance water security, improve health outcomes and foster community resilience, ultimately contributing to a more sustainable and secure environment in Mazoe Bridge ward 18 of Rushinga District. It is hoped that these findings provide a foundation for strengthening the health security in dry areas in Zimbabwe.

5.1 Summary

Chapter one gave introductory remarks to the study. The objectives of the study were to investigate the causes and consequences of water scarcity on health security in Rushinga District., to assess the effectiveness of existing water management strategies and policies and to evaluate how water scarcity impacts access to healthcare facilities and services, including sanitation and hygiene practices necessary for public health. The statement of the problem

shows that there are impacts in relying on rain fed water, inadequate water treatment, climate change countering the health security and economic hardships that needs attention counter attack them for a better environment.

Chapter two gave a literature review and theoretical frameworks for the study. The human security framework viewed health security as the critical aspect of human security, encompassing access to safe water, adequate nutrition and healthcare services. The human security framework posits that threats to health security can arise from environmental degradation, including water scarcity. Community resilience theory focuses on the ability of communities to adapt to and recover from adverse events, such as natural disasters or resource shortages. Rushinga district is located in region that has the history of receiving low rainfall each year in Zimbabwe making residents living under water scarcity problems ever-since. Therefore, this study aimed in assessing the effects of water scarcity on health security and suggest ways for the community to address these challenges.

Chapter three gave an overview of the methodology that was used in the study. A case study was the research design method that was used when the research carried out. It was conducted in Rushinga District, specifically focusing on Mazoe Bridge ward 18 area as the focus of the study. This was done as the researcher could have an in-depth information on the research questions. The paradigm that was used is pragmatism paradigm. It advocates for a practical with solutions perspective that combines different methodologies to address complex issues. As this research topic water scarcity and health security is a multifaceted one, this study will employ a mixed methods design. Combining qualitative and qualitative data insights, the research aims to provide a broader view of how water scarcity affects health in rural Zimbabwe. A sample of 80 respondents for questionnaires and 20 respondents for interviews was selected. The population included residents of Mazoe Bridge, healthcare officers, teachers and students.

Chapter four presented, analysed and discussed the research findings. There are various themes and insights that emerged in the findings and they shall be further discussed in the conclusion of the study.

5.3 Conclusions

In line with the research questions, the following conclusions were made from the findings;

5.3.1 What are the primary causes of water scarcity and their impact on health security in Rushinga District?

The findings shows that the primary causes of water scarcity are low rainfall, droughts, climate change and lack of water conservation. The impacts of water scarcity on health security in Rushinga District are increase risk of waterborne diseases, diarrhea, malnutrition, mental health, lack of hygiene and sanitation, economic burden and migration.

5.3.2 What are the existing water management strategies and policies in place?

The findings show the existing water management strategies and policies in place. The community members are putting efforts in sustainable water management practices such as constructing manmade dams and practicing sanitation practices and ending open defecation with the help of NGOs like World Vision and Welt Hunger Hilfe (WHH). The findings also shows that the community members try hard to protect their water sources like boreholes as they are being educated to take care of their dams and water tanks that are being installed by world vision.

5.3.3 How does water scarcity influence access to healthcare services and sanitation facilities in Mazoe Bridge?

The findings showed how water scarcity can influence access to healthcare services and sanitation in Mazoe Bridge. It has been evidenced that access to clean water is vital for maintaining hygiene in healthcare settings. In Mazoe Bridge, where water scarcity is prevalent,

healthcare facilities struggle to ensure adequate sanitation, increasing the risk of healthcare-associated infections. It has also shown by the findings that in Mazoe Bridge, limited access to clean water has been linked to higher rates of diseases such as cholera and dysentery, placing additional strain on local healthcare services. This shows the extend that water scarcity impacted the access to healthcare services and sanitation facilities in area of study.

5.4 Recommendations

The following suggestions have been suggested;

- Enhancing water supply infrastructure that is develop and maintain equitable water supply systems such as boreholes and surface water treatment facilities to ensure reliable access to clean water. Also promote and support rainwater harvesting techniques to supplement water supply during dry seasons.
- Health education initiatives that is community awareness campaigns and training workshops on water conservation and manage practices to empower residents
- Policy and government improvement, advocating for local authorities to priorities water security in their policies and resource allocation decisions
- Increasing funding and resource allocation, advocating for more funding from the government and international organizations for water infrastructure projects.
- Community engagement and empowerment that is engage community members in decision making processes regarding water management and channel creation for residents to provide feedback on water services and health initiatives to enhance responsiveness.

5.5 Recommendations for Further Study

- An analysis on the existing policies related to water management and health security.
- An economic analysis of the costs associated with water scarcity and its health impact.

- Assessing the effectiveness of community-led health interventions in mitigating the health impacts of water scarcity.

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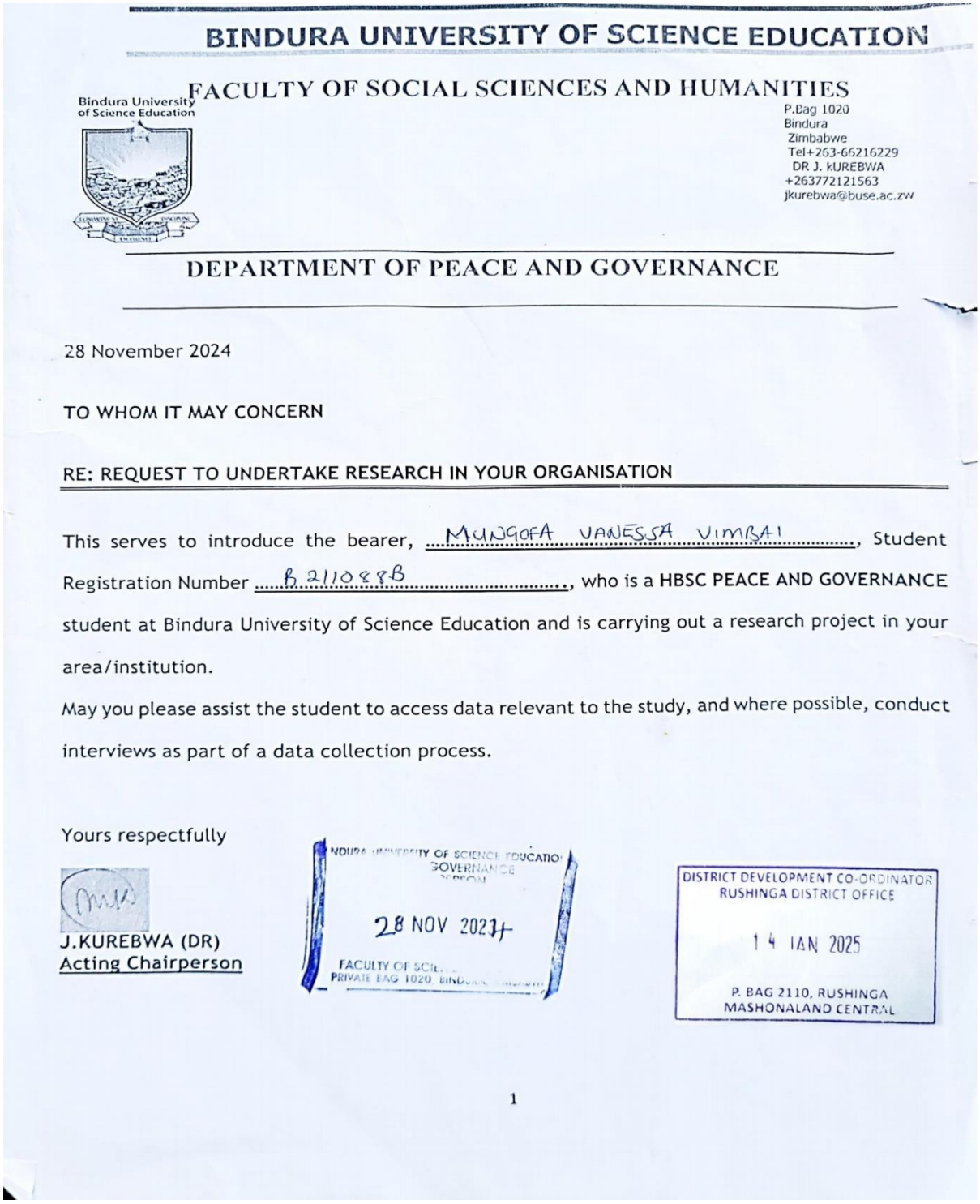
Appendix 1: Permission Letter



BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SOCIAL SCIENCES AND HUMANITIES

Bindura University of Science Education

P.Bag 1020
Bindura
Zimbabwe
Tel+263-66216229
DR J. KUREBWA
+263772121563
jkurebwa@buse.ac.zw

DEPARTMENT OF PEACE AND GOVERNANCE

28 November 2024

TO WHOM IT MAY CONCERN

RE: REQUEST TO UNDERTAKE RESEARCH IN YOUR ORGANISATION

This serves to introduce the bearer, MUNGOFA VANESSA VIMBAI, Student Registration Number B211088B, who is a HBSC PEACE AND GOVERNANCE student at Bindura University of Science Education and is carrying out a research project in your area/institution.

May you please assist the student to access data relevant to the study, and where possible, conduct interviews as part of a data collection process.

Yours respectfully

J.KUREBWA (DR)
Acting Chairperson

BINDURA UNIVERSITY OF SCIENCE EDUCATION
GOVERNANCE
28 NOV 2024
FACULTY OF SCIENCE
PRIVATE BAG 1020 BINDURA

DISTRICT DEVELOPMENT CO-ORDINATOR
RUSHINGA DISTRICT OFFICE
14 JAN 2025
P. BAG 2110, RUSHINGA
MASHONALAND CENTRAL

1

Appendix 2: Questionnaire

1.1 Purpose: To gather in-depth insights from key informants about effects of water scarcity on health security in Mazoe Bridge, Rushinga district.

My name is Mungofa Vanessa V. I am studying bachelor's degree in Peace and governance at Bindura University of Science education. I am conducting research on the effects of water scarcity on health security in Rushinga district, Mazoe Bridge to be specific. Please be assured that this research is sorely for academic purposes and it will not use for other reasons without the participants or the Bindura University of Science Education consent. All information collected will be kept strictly confidential. I appreciate your willingness to assist me in my research work.

1.2 Demographic Information

1. Age: _____

2. Sex: _____

3. Education level:

Primary level	Secondary level	Tertiary level	No Formal education
☐	☐	☐	☐

4. Employment Status: (Indicate in the box)

Employed	Unemployed	Student	Never employed	Other

5.Occupation:

_____

6. Household Income Level: (select in the box)

Low	Medium	High

Marital status: _____

1.3 Water Access

1. Do you have access to clean drinking water?

[ ] Yes

[ ] No

2. Where do you obtain your water?

[ ] Borehole

[ ] River/Stream

[ ] Rainwater

[ ] Other (please specify): ____

3. How far do you travel to access water?

[ ] Less than 1 km

[ ] 1-2 km

[ ] More than 2 km

4. On average, how much time do you spend collecting water each day?

[ ] Less than 30 minutes

[ ] 30 minutes - 1 hour

[ ] More than 1 hour

1.4 Health Implications

1. Have you or any other family members experience waterborne diseases in the last year?

[ ] Yes

[ ] No

2. If yes, what type of diseases?

[ ] Cholera

[ ] Diarrhea

[ ] Typhoid

[ ] Other (please specify): _____

3.How often do you seek medical treatment for health issues related to water?

[ ] Never

[ ] Occasionally

[ ] Frequently

1.5. Coping Strategies

1. What measures do you take to ensure water safety?

[ ] Boiling water

[ ] Using chlorine/tablets

[ ] Filtering

[ ] None

2. Have you received any education on water sanitation and hygiene?

[ ] Yes

[ ] No

1.6. Community Support

1. Is there community support available for water access?

[ ] Yes

[ ] No

2. What types of support have you received?

[ ] Access to clean water sources

[ ] Health education programs

[ ] Financial assistance

[ ] Other (please specify): ____

Thank you

Appendix 2: Interview guide

2.1 Purpose: To gather in-depth insights from key informants about the effects of water scarcity on health security in Mazoe Bridge.

2.2 Introduction

My name is Mungofa Vanessa V. I am studying bachelor's degree in Peace and governance at Bindura University of Science education. I am conducting research on the effects of water scarcity in Rushinga District, specifically Mazoe Bridge. Please be assured that this research is sorely for academic purposes and it will not be used for other reasons without the participants or the Bindura University of Science Education consent. All information collected will be kept strictly confidential. I appreciate your willingness to assist me in my research work.

2.3 Demographic Information:

- Name (optional): _____
- Position/Role in the community: _____
- Years of experience in this role: _____

2.4 Experiences with Water Scarcity

- ✓ What challenges do you face in accessing clean water?
- ✓ How has water scarcity impacted your daily life? (e.g., time spent collecting water, quality of life)
- ✓ Have you noticed any changes in water availability over the years? If so, what are they?

2.5 Health Implications

- ✓ Can you share any experiences of health issues related to water scarcity? (e.g., specific diseases)
- ✓ How do you believe water scarcity affects the overall health of your community?

2.6 Coping Strategies

- ✓ What strategies do you and your family use to ensure water safety?
- ✓ Have you received any training or education regarding water sanitation? Can you elaborate?

2.7 Community Support and Resources

- ✓ What types of community support exist to help with water access?
- ✓ Have you benefited from any programs or initiatives aimed at improving water access or health education?

2.8 Suggestions for Improvement

- ✓ What improvements would you suggest to enhance water access and health security in your community?
- ✓ Are there any additional resources or support you think would be beneficial?

Thank you for your cooperation

Appendix 3: Focus Group Discussion Guide

3.1 Purpose: To facilitate a group discussion among participants to explore their perceptions and experiences regarding the issue of water scarcity and its effects on health security of the community

3.2 Introduction

My name is Mungofa Vanessa V. I am studying bachelor's degree in Peace and governance at Bindura University of Science education. I am conducting research on the effects of water scarcity on health security in Rushinga District, specifically Mazoe Bridge. Please be assured that this research is sorely for academic purposes and it will not be used for other reasons without the participants or the Bindura University of Science Education consent. All information collected will be kept strictly confidential. I appreciate your willingness to assist me in my research work.

3.3 Discussion Questions:

3.3.1 Water Access

- ✓ How would you describe the current state of water access in Mazoé Bridge?
- ✓ What are the main sources of water for your community, and how reliable are they?

3.3.2 Impact of Water Scarcity

- ✓ In what ways has water scarcity affected your daily routines and activities?
- ✓ How has it influenced the health of individuals in your community, particularly regarding waterborne diseases?

3.3.3Coping Mechanisms

- ✓ What strategies do community members employ to cope with water scarcity?
- ✓ How effective do you find these strategies in ensuring access to safe water?

3.3.4 Health Implications

- ✓ Have you or your family experienced any health issues related to water scarcity? Can you share specific examples?
- ✓ How do you believe water scarcity impacts the overall health security of your community?

3.3.5 Community Support

- ✓ What forms of support or assistance does the community receive regarding water access

and health education?

- ✓ Are there any local organizations or government initiatives that have made a positive impact?

3.3.6 Suggestions for Improvement

- ✓ What changes would you recommend to improve water access and health security in your area?
- ✓ How can the community work together to address the challenges posed by water scarcity?

3.3.7 Future Outlook

- ✓ How do you see the situation evolving in the next few years regarding water access and health security?
- ✓ What role do you think community members can play in advocating for better water management and health resources?

THANK YOU

VANESSA DISSERTATION THESIS.docx

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