Bindura University of Science Education

Faculty of Science and Engineering

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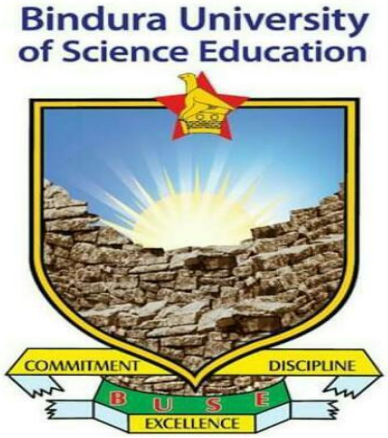

COPING MECHANISMS IN THE AFTERMATH OF THE 2023/24 DROUGHT AND THEIR IMPLICATIONS ON FOOD SECURITY AND LIVELIHOODS. A CASE STUDY OF BINDURA DISTRICT.

A dissertation submitted in partial fulfillment of the requirements for the Bachelor of Science Honors Degree in Development Studies.

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Name of Supervisor: Dr Mhlanga

2025

DECLARATION

I hereby declare that the research project entitled '**coping mechanisms in the aftermath of the 2023/4 drought and their implications on food security and livelihoods**', submitted to Bindura University of Science Education, Department of Sustainable Development is a record of an original work done by me under the supervision and guidance of Dr Mhlanga and this work is submitted in partial fulfillment of the requirements for the award of a Bachelor of Science Honors Degree in Development Studies. The results obtained in this thesis have not been submitted to any university or institute for the award of any degree or diploma.

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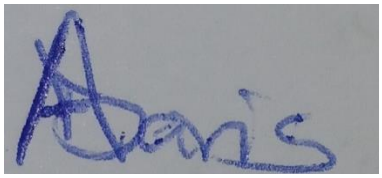

ABSTRACT

The research was about coping mechanisms in the aftermath of the 2023/24 drought and their implications on food security and livelihoods. The study employed the sustainable livelihood approach. Guided by the mixed approach paradigm, the researcher used a mixed research methodology which included the use of questionnaires and key informant interviews for data collection. Purposive and stratified sampling method was used to select 80 respondents. SPSS was used for data analysis. The study found the common coping strategies as a result of the drought. Most of the households were food insecure, their food consumption patterns were negatively affected and also the drought severely disrupted livelihoods. As a coping mechanism, households have resorted to reduced food intake, selling livestock or assets. Therefore from the study, the researcher recommends that the gorvernment should enforce detailed drought response methods that includes immediate relief efforts for example food aid and financial assistance, focus on training farmers in sustainable practices and providing assess to drought-resistant seeds and technologies, and lastly the government should also raise awareness and educate people about climate change, drought specifically and its impacts on agriculture and food security and this can empower them to take measures in case it does happen again in the future.

KEY WORDS: Drought, coping mechanism, food security, livelihood, household.

APPROVAL FORM

The undersigned certify that they have read this project and made recommendations to Bindura University of Science Education for acceptance for a research project entitled, “The coping mechanisms in the aftermath of the 2023/24 drought and their implications on food security and livelihoods in Bindura District. The project was submitted in partial fulfillment of the requirements of Bachelor of Science Honors Degree in Development Studies.

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First of all, I would like to thank God for giving me the faith and strength to finish this project. I would like to express my deep gratitude to my supervisor Dr Mhlanga, for his generous help, support, and countless time of reviewing, reading, editing, and advising. I highly benefitted from his knowledge, guidance, and experience. My deep gratitude to my family, Mr and Mrs Davis, Ashton, Ashwin and Ashnance, for their continuous and unconditional love, care, and support. Their encouragement motivated me to strive to achieve my goals, and I could have not completed this work without their support and patience. I would want to appreciate the unwavering support from Maxwell Raymond who was supporting me from the start up to the end of this research. Special thanks to all the friends and associates who helped me with my work.

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ACRONYMS AND ABBREVIATIONS

AEZ	Agro-Ecological Zones
SLA	Sustainable Livelihood Approach
SPSS	Statistical Package for Social Sciences
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

CHAPTER 1

1.1 INTRODUCTION

Drought poses a serious global threat, especially to food security and rural ways of life. The consequences of drought are especially severe in farming areas such as Bindura District where agriculture is the main source of livelihood. According to Musemwa (2023), over two billion people live in arid regions covering 41% of earth's surface, and drought has a clear damaging impact on both poverty and household incomes in these areas. To address the problem, we must take a multifaceted approach. Wilhite (2000), explains drought as a natural phenomenon that occurs when rainfall drops significantly below normal levels for a prolonged period. Insufficient rainfall often causes crop failure which in turn reduces household food availability, increasing the risk of hunger and poor nutrition. In response, communities usually adopt locally-developed strategies to lessen the hardships brought by drought.

This study examines the Coping mechanisms in the aftermath of the 2023/4 drought and their implications on food security and livelihoods in Bindura District. Documenting how local people respond to drought is essential for strengthening resilience and promoting long-term livelihood sustainability especially in the context of climate change in Bindura District. By studying how communities adapt and respond to drought, we can learn valuable lessons that may be applied in other regions facing similar challenges.

1.2 BACKGROUND OF THE STUDY

Drought is considered one of the most destructive natural hazards affecting people and ecosystems worldwide. Between 1967 and 1991, around half of the 2.8 billion individuals impacted by food-related crises were affected by drought (Rosemary, 2017). Extended dry spells lasting years or even decades have been recorded across the last thousand years in regions like North America, West Africa and East Asia. When these harsh weather conditions strike during key stages of the planting season, they disrupt farming activities across the globe, leading to serious economic and social consequences (Manyeruke et al, 2013).

Severe drought conditions are affecting much of Southern Africa, (Museyamwa et al, 2020), and the situation is being worsened by increasing temperatures and prolonged heat waves. The worst droughts were those in 1910s, which affected east and West Africa alike (Museyamwa et al, 2020). The 2024 rainy season has been a challenging one as a result of El Nino pandemic which was characterized by late rainfalls and lack of adequate rainfalls to supplement the whole

season. El Nino-induced droughts have affected tens of millions of people across various countries, leading to sharp declines in crop yields and livestock production (Gumindoga, 2023).

Agriculture plays a vital role in Zimbabwe's economy, accounting for about 19% of the national GDP. Nearly 80% of the population relies on this largely rain-fed sector for their survival (Madzwamuse, 2010). Zimbabwe was once known for its strong agricultural output and even exported food regularly, consistently producing surpluses in previous years (Chirimuuta, 2015). However, in recent years, reduced rainfall has led to a sharp decline in agricultural productivity (FAO, 2013). In the last ten years, Zimbabwe has frequently experienced rainfall patterns that diverge significantly from long-term averages (UNEP, 2010). During the 2012 drought, the country faced a nearly 45% shortfall in maize, its staple food crop (FDI, 2012). Since 2002, recurring droughts in rural Zimbabwe have led to the decline of agriculture-dependent livelihoods, limiting community development and food access. These challenges have deepened rural poverty and prompted responses such as the adoption of conservation agriculture and distribution of food aid.

1.3 STATEMENT OF THE PROBLEM

Historically, droughts have severely decreased agricultural output in Bindura, especially affecting key crops like maize and small grains. ZIMVAC (2021) reports that numerous farmers in the Bindura area have faced major crop failures during dry spells, leading to increased food insecurity. Bindura relies heavily on rainfall for farming, and because of this it is highly exposed to climate shifts, which often cause food shortages and rising prices during drought seasons. FAO (2020), highlights that reduced water availability limits agricultural production and forces communities to rely more on food imports and humanitarian aid. Following the El Nino-triggered drought that hit Zimbabwe in 2023, there remains a lack of detailed information about how communities in Bindura have managed the crisis and what this means for their food security.

1.4 RESEARCH AIM

To assess the coping mechanisms employed and their effects on food security and livelihoods in the aftermath of the 2023/24 drought in Bindura District.

1.5 RESEARCH OBJECTIVES

1. To identify effects of the 2023/24 El-Nino-induced drought in Bindura District?

2. To investigate the coping mechanisms employed by the communities of Bindura District in the midst of the 2023/24 drought.

3. To analyse the effectiveness of the coping mechanisms employed in Bindura District in mitigating the effects of drought and enhancing food security.

1.6 RESEARCH QUESTIONS

1. What were the effects of the 2023/24 El-Nino-induced drought in Bindura District?

2. What were the coping strategies that were implemented to mitigate the effects of drought?

3. How effective have these drought coping mechanisms in mitigating the effects of drought and enhancing food security and livelihoods?

1.7 SIGNIFICANCE OF THE STUDY

This research offers valuable insights into how agricultural systems can be fortified against climate variability, understanding that coping mechanisms can inform policies aimed at ensuring stable food supplies. Exploring the implications of drought on livelihoods can highlight vulnerable populations and sectors, and this information is critical for designing targeted support programs that protect income sources. The findings can also guide policymakers in creating effective interventions that enhance community resilience, improve resource management and support sustainable agricultural practices. Investigating how communities adapt to drought conditions can reveal resilience strategies that may be applied in other regions facing similar challenges. This understanding can help in developing frameworks for future drought preparedness.

1.8 DEFINITION OF KEY TERMS

1.8.1 Drought

Various scholars (McGuire et al, 1957; Thurow et al, 1999; Wilhite et al, 2014) have offered different perspectives on what defines a drought. The complexity of defining the term drought is noted by Wilhite et al (2014) who posits that the term ‘drought’ has several conflicting interpretations. Even so, McGuire et al (1957) explains that drought is a period of monthly or annual precipitation below a specific percentage that is considered normal.

1.8.2 Categories of drought

Bang et al (2003) categorize drought into four main types which are meteorological, hydrological, agricultural and socioeconomic drought. These classifications are mostly used to

gauge how severe a drought is in a given region. It is advisable to think of these four types of drought as a natural progression rather than as mutually exclusive.

a. Meteorological drought

Meteorological drought refers to a period when rainfall is significantly below the average expected in a particular area, also known as climatological drought (Golian et al., 2015). Wilhite (2000) asserts that as atmospheric circumstances that lead to precipitation deficits depend on climatic regimes, meteorological drought definitions ought to be regarded as region-specific. Hisdal et al (2000) describes meteorological drought as a period when precipitation falls noticeably below the usual level for that specific time frame. The methods used to differentiate drought from non-drought periods are rarely specified and meteorological definitions of drought are frequently site-specific. Hayes (2011) points out that meteorological drought definitions differ across regions and were developed to suit the unique climate conditions of each area. He adds that while six months without rain might signal drought in one region, the same condition in another may not be classified as drought unless it persists for two years.

b. Hydrological drought

Hydrological drought refers to a significant decline in water availability including rivers, lakes, reservoirs and groundwater during the land-based phase of the water cycle (Loon, 2015). These forms are described by a variety of hydrological variables, but stream-flow is by far the most important one when considering water quantity. Therefore, a stream-flow deficit relative to typical conditions is associated with a hydrological drought occurrence. Wanders (2015) adds that hydrological drought covers all significant drops in both surface and underground water reserves. It can manifest through shrinking wetlands, reduced flow in rivers and unusually low groundwater or lake levels. When compared to regions with considerable seasonality, hydrological droughts generally develop differently in relatively stable climates. Van Lanen and Van Loon, (2015) created a classification system to better understand the different types of hydrological drought. They grouped hydrological droughts by examining what causes them and how they evolve over time. The categories include:

- Classical rainfall deficit drought
- Rain-to-snow season drought
- Wet-to-dry season drought

- ❖ Cold snow season drought
- ❖ Warm snow season drought
- ❖ Snowmelt drought.

c. Agricultural drought

Ramamasy (2007) defines agricultural drought as a condition where the soil lacks enough moisture to support healthy crop growth at a crucial stage. Sivakumar et al, (2011) explains that agricultural drought is more concerned with the availability of soil water for plant growth than just the absence of rainfall. A few months after the signs of agricultural drought start to show themselves, crops are harvested, and the impact of this widespread phenomenon is not fully evaluated, poor crop conditions, rain/monsoon system failure, and lack of precipitation are some of the signs.

d. Socioeconomic drought

According to FAO (2013), socioeconomic drought is a combined outcome of agricultural, hydrological and meteorological droughts affecting the social and economic fabric of communities. (Hong, 2022) states that socioeconomic drought occurs when an area or nation experiences persistent, severe drought that disrupts its socio-political and economic conditions. It is the only type of drought caused by artificial sources (Tu et al., 2018). According to Mendelsohn et al (2011), when water demand outpaces water supply, socioeconomic drought occurs, which leads to a number of social, economic and environmental issues. Regional water demands have grown as a result of population and industry growth and socioeconomic drought has emerged as a significant issue affecting the economic development of many nations and regions worldwide (Madani, 2014).

1.8.3 Livelihoods

A livelihood includes the activities and resources (such as social networks, technology, and skills) needed to earn a living and maintain a high standard of living (Haan, 2012). According to Chambers et al (1991), a livelihood is made up of the things that are necessary to keep life going as well as assets and capacities (which might include both material and social resources). A person's household possibilities for a living are determined by the technology, resources, and talents that are available to them.

1.9 ORGANIZATION OF THE STUDY

This study is structured into six chapters. Chapter 1 provides an introduction to the research, covering the background, the main problem being investigated, research aim and objectives, guiding questions, justification for the study and its importance and definition of key concepts. Chapter 2 reviews previous research relevant to the topic and outlines both the theoretical and conceptual frameworks that guide this study. Chapter 3 explains the methodology used including the research design, the approach taken, the study population and sample, data collection methods, ethical considerations and how the data was analysed. Chapter 4 focuses on presenting, interpreting and analysing the data collected from the field. On chapter 5 results are discussed and they are connected with the theoretical framework and previous studies reviewed in chapter 2. Chapter 6 concludes the research by summarizing key findings, drawing conclusions and offering recommendations for future studies.

1.10 SUMMARY OF THE CHAPTER

This chapter established the basis of the study by outlining the research background, identifying the problem and stating the main aim and objectives. It also includes the research questions that directed the inquiry and explained why the topic was worth investigating. The chapter further highlighted the importance of the research and defined key terms for clarity. Finally the chapter closed by outlining how the remaining chapters are organized throughout the study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview of the research on drought and its effects. The primary goal of this research is to evaluate the drought coping mechanisms used by Bindura residents in response to the 2023/24 drought and their impacts on food security and livelihoods. It starts by outlining the theoretical framework and in this case, sustainable livelihoods theory is used. It will also cover the global, Southern Africa, African and Zimbabwean drought trends alongside discussions on drought's impacts, existing coping mechanisms, their effectiveness and food security in Zimbabwe. After providing a summary of Zimbabwe's drought condition and management structure, the chapter goes on to outline drought coping mechanisms and their effectiveness. Food security and its status in Zimbabwe are covered in this chapter as well as the research gaps.

2.2 THEORETICAL FRAMEWORK

Grants (2014) defined theoretical framework as a reflection on how a researcher applies a theory in their study. The theoretical framework for this study is built upon the sustainable livelihoods approach. This framework offers a foundational perspective for the literature review and helps structure the research by identifying key elements that guide the entire project (Lysaght, 2011). The study uses this approach to understand coping mechanisms for drought.

2.2.1 Sustainable livelihoods theory

The sustainable livelihoods approach aims to understand how vulnerable populations can survive crises like droughts and economic shocks and cope with stresses without damaging their livelihood assets. Initially introduced in research during the 1980s (Morse et al., 2009), and later developed by the Department for International Development (DFID), the term "sustainable livelihoods" was widely adopted by organizations like the World Commission on Environment and Development in 1987 (WCED, 1987). Cherutich (2012), explains that this framework helps analyze how different groups use their resources to sustain their living conditions and improve their understanding of livelihood strategies.

The sustainable livelihoods framework consists of five components as shown in Fig 1 and these are interlinked and can lead to sustainable livelihood outcomes when implemented properly. Firstly there is context which according to DFID (2001), means the conditions people live in

for example natural disasters like drought, climate. Another component of the framework is livelihoods resources which states that the conditions people live in may affect the livelihood resources for example drought can significantly impact the condition of these resources which includes natural capital, economic capital, human capital if not properly managed (Scoones, 1998).

The third component consist of institutions and organizations which according to Scoones (1998), states that they should focus on fostering a supportive environment that helps people manage and endure drought conditions. Furthermore, there is livelihood strategies as a component of sustainable livelihoods framework which pertains to a setting where individuals can discover their abilities and approaches to attain sustainable livelihoods and in this case Scoones (1998), states that people can devise strategies even if they are in a setting that does not limit them. The last component of the framework is sustainable livelihood outcomes which includes reduced poverty, enhanced food security, increased income and also efficient use of resources.

Sustainable livelihoods theory can be used to understand how El Nino-induced drought coping strategies affect livelihoods and food security. The theory offers a framework for comprehending people's and groups' means of subsistence. The theory looks at how drought induced disasters affect people's livelihoods and tries to pinpoint coping strategies. According to Ashley et al (1999), the sustainable livelihoods theory guarantees that significant elements are not overlooked by acknowledging various settings and livelihood methods in order to eradicate food insecurity.

According to Ashley et al (1999), the framework demonstrates how several strategies like migration, diversification and substitution are used to establish sustainable livelihoods in various situations. The sustainable livelihoods approach can support both the planning of development initiatives and the assessment of how current initiatives affect livelihood sustainability. The research indicates that the framework can help design development initiatives that prioritize people, respond to their needs and involve collaboration between public and private sectors.

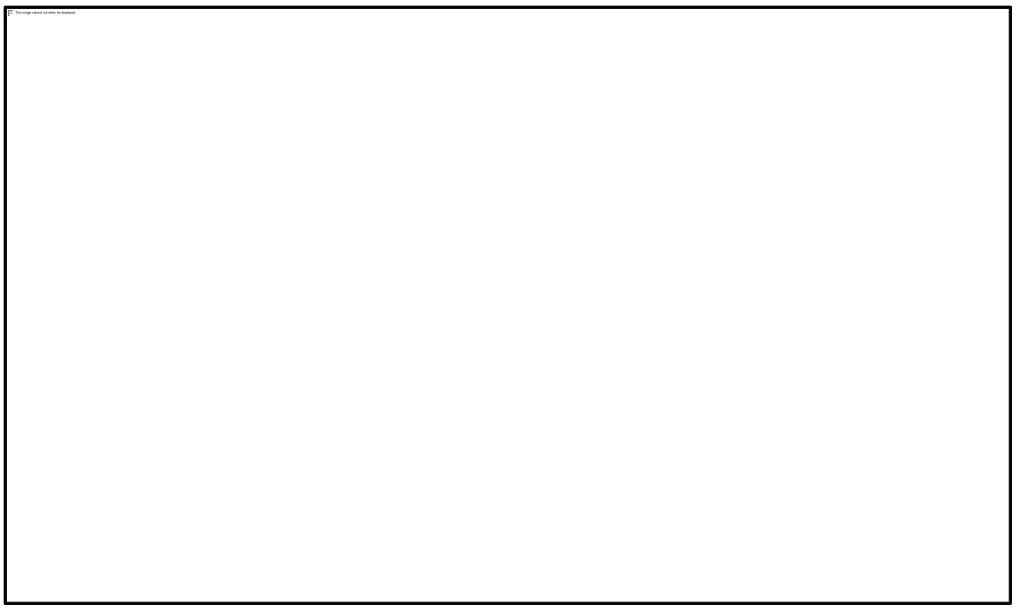

Figure 1. The Sustainable Livelihoods Framework. Source, (Serrat, O. 2017).

2.2.2 Strengths and weaknesses of the sustainable livelihood approach.

This framework comes with both advantages and limitations. The context enables an examination of how projects influence people's decision-making based on the risks they encounter and the resources available to them (Fujisaka et al. 2000). According to Chambers et al (1992), involving local communities in the decision-making process under the sustainable livelihood approach enables them to recognize their own problems and create suitable solutions. This participation promotes ownership and accountability which is a key benefit of the approach.

Furthermore, using a structured framework method allows researchers to collect both quantitative and qualitative data that reveals patterns and trends in coping techniques, and this is because it offers more structure than simply collecting tales (Stoll et al., 2002). The sustainable livelihood approach, according to Clark and Carney (2008), offers a means of comprehending drought-induced disasters and the connections between various livelihood aspects, thereby assisting the researcher in understanding these various aspects that are essential in creating efficient coping mechanisms.It is an adaptable framework, for instance it allows for a more rigorous analysis and provides a fuller, more nuanced understanding. A flexible framework enables the inclusion of various stakeholders such as farmers and local organizations in the analysis and this step enriches how drought impacts livelihoods.

Moving on, the sustainable livelihoods approach promotes unconventional thinking and releases researchers from traditional methods that are frequently limited to recognizing issues

and coming up with solutions (Fisher, 2003). This aids by promoting innovative problem-solving techniques that enable citizens to take charge of creating their own coping mechanisms and cultivating a sense of pride in overcoming their obstacles. In order to make development activities more process-oriented, development practitioners must examine relationships and circumstances.

The cannon (2003), states that livelihood strategies are constrained by the context of vulnerability which is characterized by insecurity in the well-being of individuals, households and communities in front of changes in its external environment. For example in vulnerability, there is an external side of shocks, seasonal and important trends such as droughts. The principle in this study is paramount as it helps identify factors that make people susceptible to disruptions, stress and seasonality. Another importance is that the structure can help analyze the effects of drought on livelihood and inform the identification of effective copy strategies and adaptation measures.

In Zambia, the SLA has been used by ecologists, agriculturalists, anthropologists and economists to assess the changing rural systems and the accompanying development challenges (Foy et al. 1990). Conversely, in India, a classic series of studies evaluated the diverse impacts of the Green Revolution (Farmer, 1977). These studies focused on the micro-economics of farm production and patterns of household accumulation (Scoones, 2009). The classic examination of rural change in northern Nigeria offered important insights into the contested patterns of livelihood change (Watts, 1983).

However, the sustainable livelihood approach suffers from a lot of weaknesses and some of which are very large and complex to apply, require a lot of expertise and time (Firington et al., 1999). A study in Cali city in Aguablanca Columbia district states that sustainable livelihood approach is very widespread and there are questions on how far and how far it should go when implementing it (Parkinson and Ramirez, 2006), therefore the approach may lead to a lack of specificity in addressing the unique challenges posed by drought and also it might complicate implementation as it requires addressing multiple dimensions of livelihoods. Moreover, Carney et al. (1999) criticize the theory for neglecting strategic gender needs and for failing to give guidance on changing gender inequalities and this is a disadvantage to the study as it cause bias on results as there is no gender balance and also it leaves only one gender benefitting whilst the other does not. There is a risk that communities may become reliant on external agencies

for support, which can undermine local capacity building and sustainability (Krantz, 2001). If communseverelldepend on external support, resources may be allocated in ways that do not prioritize local needs and this can result in ineffective coping strategies that do not adequately address the specific impacts of drought on livelihoods.

2.3 DROUGHT TRENDS GLOBALLY

Since the 1970s it has been noted that globally there has been a tendency towards drying (Miyan, 2015). Since that period, droughts have become more frequent due to climate change (Cook et al., 2018). As a result of future warming scenarios, extreme droughts globally are expected to increase. Drought is a climate event which occurs more frequently over most parts of the world featured by long duration and low predictability. Kallis (2008) states that during the last millennium, the dry period lasting for decades has occurred several times, for example, North America, West Africa and East Asia.

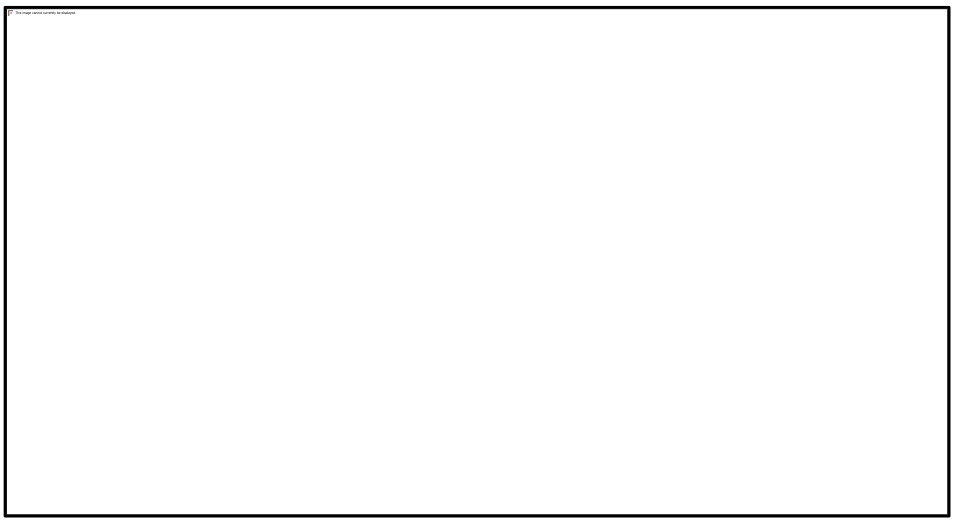

Figure 2. The diagram shows drought severity in parts of the world (Motiee, 2012).

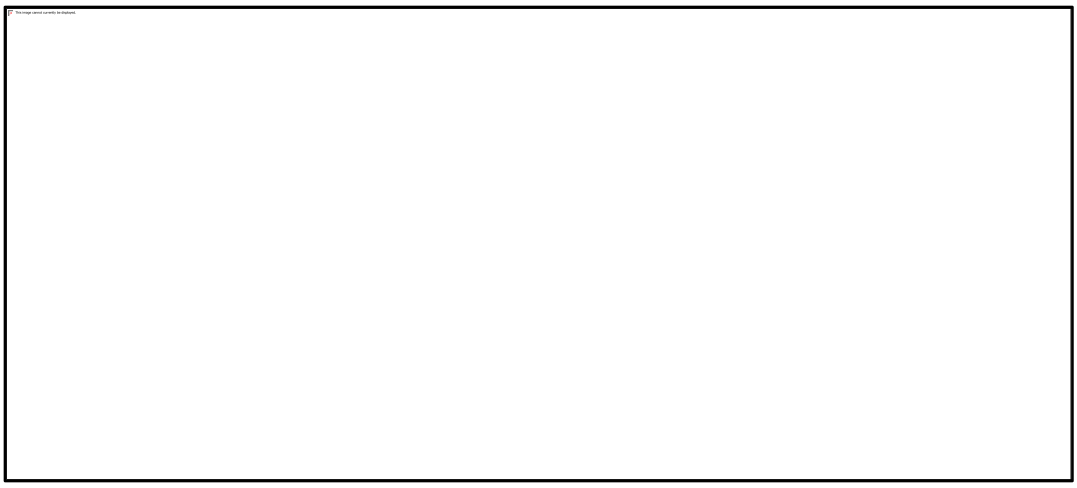

Figure 3. The diagram shows areas severely affected by drought in the periods 1951-1970, 1971-1990 and 1991-2010 (J. Spinoni et al, 2013).

2.4 DROUGHT TRENDS IN AFRICA

Drought is still a common occurrence in African nations, primarily due to unfavorable weather patterns and climatic fluctuations that negatively affect livelihoods and food security. In any given year, drought impacts 14% of the population in arid regions of Africa (World Meteorological Organization, 2020). The vast majority of African nations are highly susceptible to drought and have little ability to adjust to its effects. Climate change is anticipated to raise both the frequency and intensity of droughts in regions of Africa that are already experiencing water stress (IPCC, 2014). It has been noted that development and economic growth in the African continent have been hampered by the drought episodes, which have resulted in many fatalities and property destruction (Terray, 2012).

Every drought episode threatens food security and has a noticeable effect on the local economy. For instance, the recent droughts in 2010 and 2016 is said to have caused over 10 million people to go without food, which led to the loss of lives and livelihoods throughout Africa (Uhe, 2017). According to Benson and Clay (1994), drought is frequently regarded as the primary natural disaster in Africa and a recurring aspect of the continent's climate. Many African nations are susceptible to the consequences of drought because of they rely on rain-fed livestock and agricultural output (FAO, 2013).

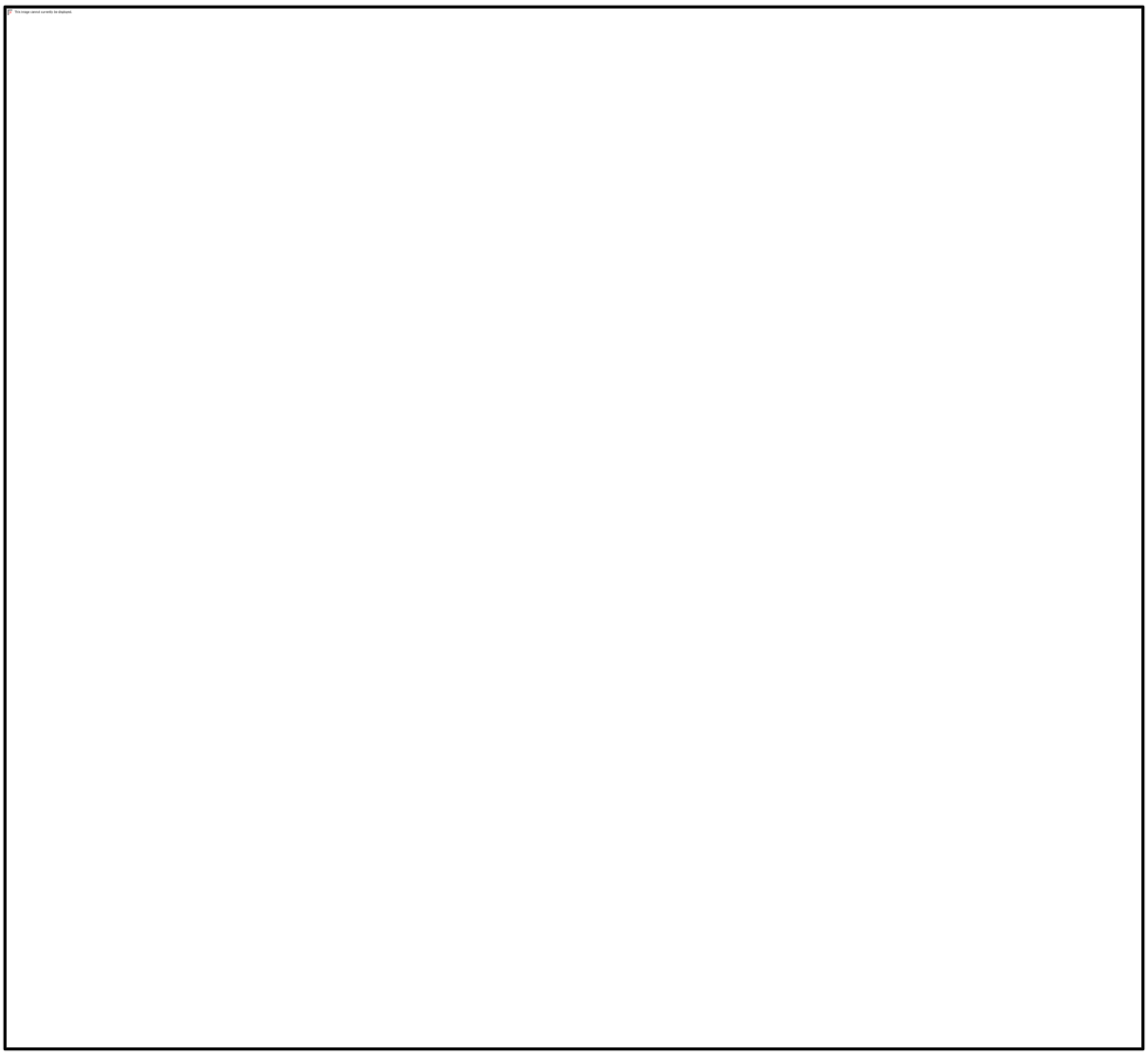

Figure 4. The diagram illustrates selected drought's geophysic coverage was indicated by 1910-1911, 1931-1932, 1940-1941, and 1948–1949 12 months of 12 months by SPEI-October-September (Maskey, 2014).

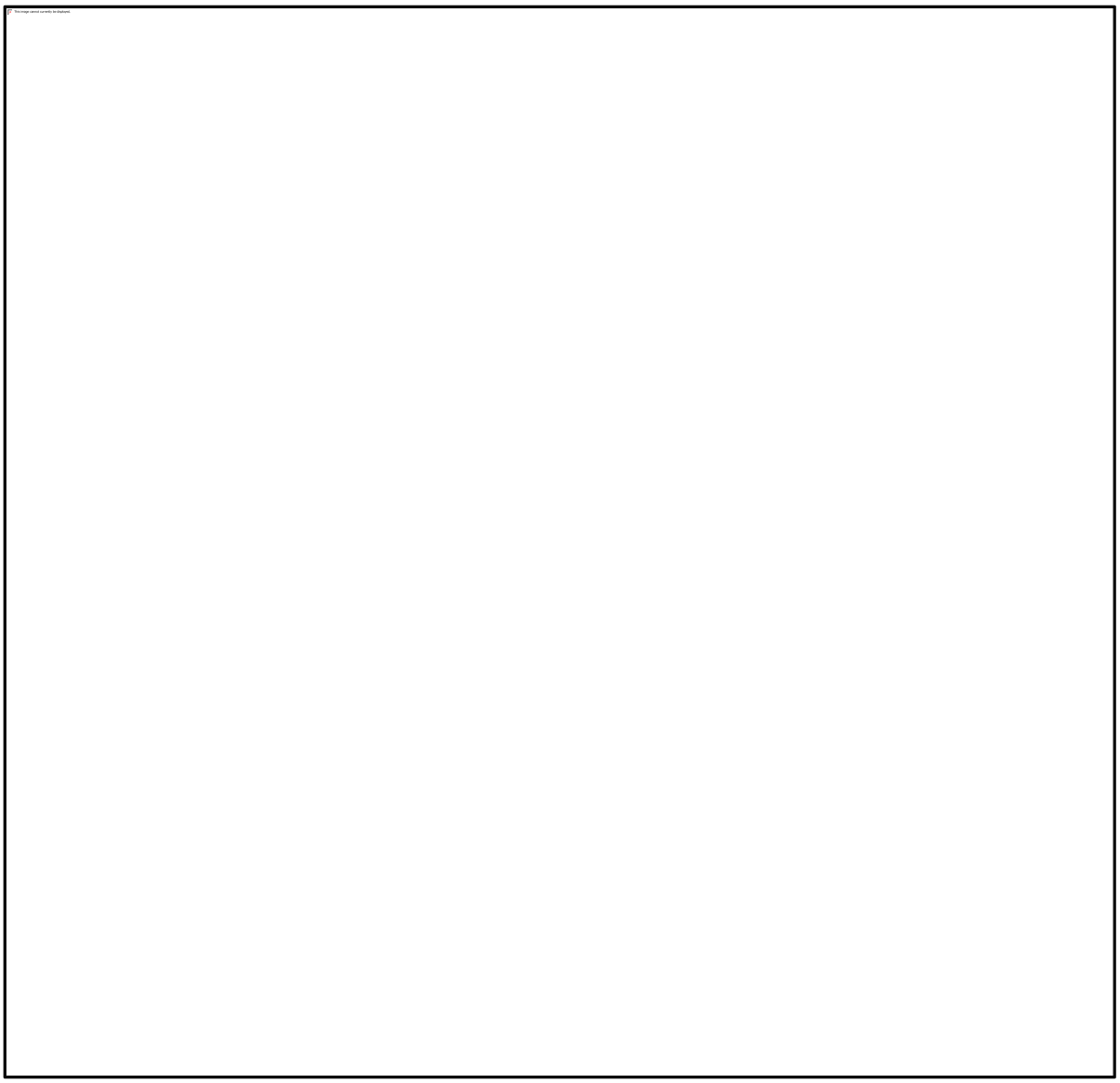

Figure 5. The diagram is showing the peak coverage of the extreme drought of 1964–1965, 1972–1973, 1983–1984, and 1991–1992 was indicated by 12 months-October-October-September (Maskey, 2014).

2.5 DROUGHT TRENDS IN SOUTHERN AFRICA

For more than a century, droughts have been a recurring phenomenon in the arid regions of Southern Africa. Southern Africa has experienced a widening range of drought since the 1970s, making it one of the most catastrophic natural catastrophes in the region (Rouaut and Richard, 2005). At least 18 million people were the most highly impacted by the drought in Southern Africa during the 2015–2016 season, according to the Southern African Development Community (2016). Severe food insecurity was brought on by the combined effects of drought in Southern Africa, though to differing degrees in different nations. By the end of September

2016, 38% of Malawians, 34% of Lesothoans, and 58% of Swaziland's population were facing food insecurity due to the effects of drought, and so was 38% in Malawi, 34% in Lesotho and 29% in Zimbabwe (WFP, 2016).

According to the Food and Agriculture Organization (2016), drought has had a major impact on food production and agriculture in the southern African region. 60% sub-Sahara Africa is considered a threat of drought (Benson & Clay, 1998). Most people in southern Africa depend as the primary source of their income on agriculture, so it is important to understand the effects of drought (Jury, 2002).As a response to drought shocks, farmers in Southern Africa often increase the output of early-maturing crops like vegetables or drought-tolerant crops like roots and tubers.

The International Disaster Database (EM-DAT, 2024) estimates that between 1950 and 2021, drought events impacted about half a billion people in Southern Africa, resulting in approximately 700,000 reported deaths and $6.6 billion in damage. This slow change is a result of drought. However, droughts are a common occurrence in agriculture, which got significant effect on food supplies and livelihoods, particularly for smallholder farmers.

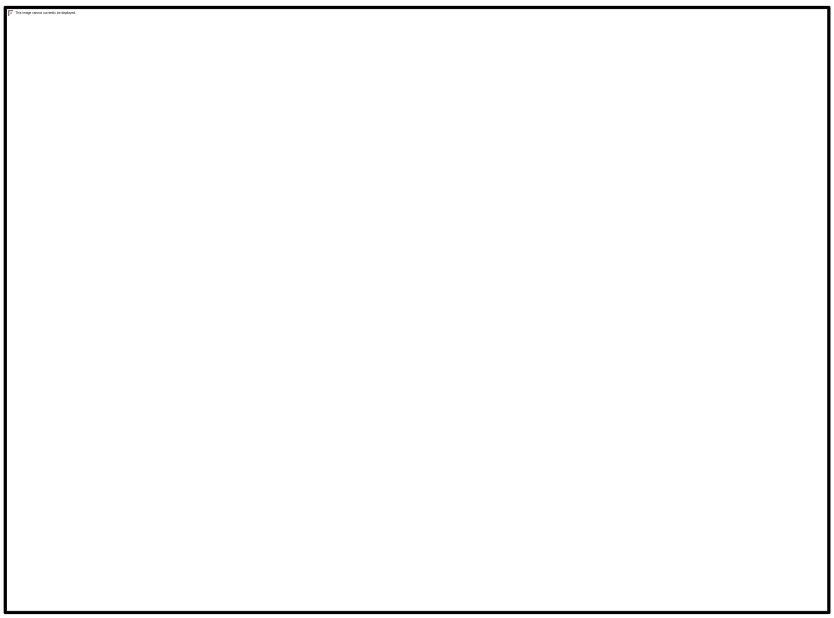

Figure 6. The diagram shows mean frequency of dried mantra in Southern Africa 1979/80-2001/02 Australia average in summer (Usman, 2004).

2.6 DROUGHT TRENDS IN ZIMBABWE

Numerous regions of the world have experienced periodic droughts due to changes in rainfall patterns brought about by climate change and variability, and Zimbabwe has not been exempt

from these severe shifts. Agro-ecological zones (AEZ) in Zimbabwe have changed significantly as a result of the destructive consequences of droughts. Mugandani (2012) claims that there have been significant changes in the dried areas of Zimbabwe which are region IV and V, which are drier than they were in the past. There have been significant changes in the size, composition and structure of five natural areas, which may indicate a decline in food production and, as a result, issues with food security. According to Weiner (1985), it shows that the dry regions IV and V have increased by 5.6% and 22.6% respectively, and indicate that Zimbabwe's climate conditions are flowing towards relatively dry conditions that are not favorable for agriculture, therefore there is food insecurity as a result of this.

Activities are carried out to keep people alive and enable them to preserve life throughout major calamities like droughts. Stream-bank cultivation was one of the livelihood practices used in Zimbabwe during droughts. For instance, in an effort to combat drought-related hunger, 87% of respondents in Muzarabani engaged in riverbank farming (Ncube, 2014). Bang (2008) pointed out that the most crucial considerations for a community before making any subsequent migration or relocation decisions are those connected to livelihoods and income. The issue is frequently not merely ignorance, but rather experience-based risk assessment of local hazards that undervalues the effect of risk accumulation (Few, 2005).

Despite the use of many mitigation techniques, drought is one of the frequent calamities that might jeopardize livelihoods and well-being (Mugotsi, 2012). Climate change and global warming pose a greater threat to Zimbabwe's farming and food security than a lack of resources or expertise (FAO, 2008). Drought mitigation involves a wide range of agencies, including non-governmental groups, local leadership, and government ministries. Agricultural inputs, income-generating activities, and irrigation building are some of the risk reduction measures that these agencies have put in place to help communities become more drought-resistant (Mavhura, 2015). The majority of Zimbabwean households used a variety of drought mitigation techniques and mainly depended on government and non-governmental groups for drought assistance.

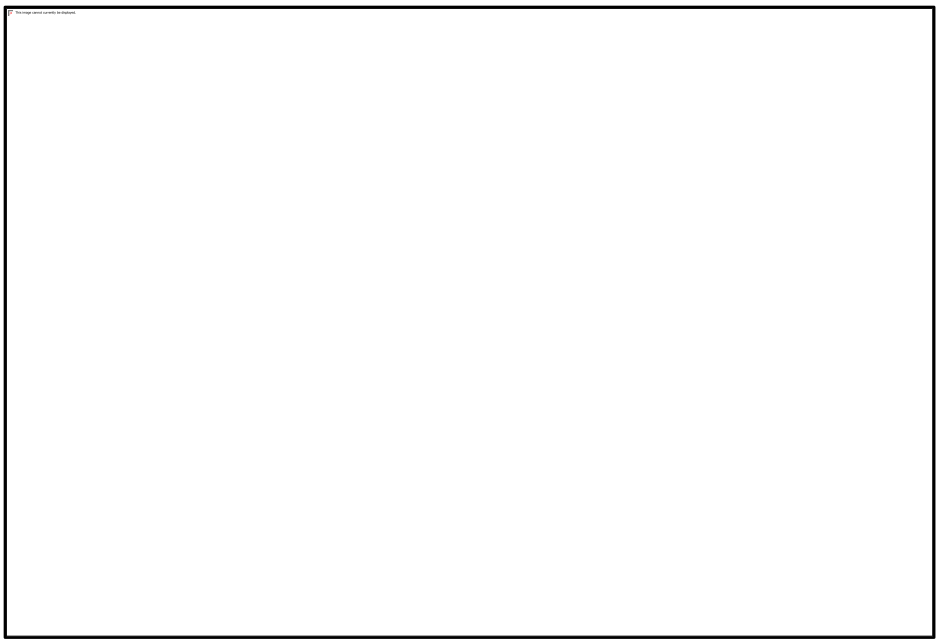

Figure 7. The diagram is showing drought spatio-temporal dynamics between 1990 and 2020 (Manatsa, 2020).

2.7 IMPACTS OF DROUGHT

Drought knows no boundaries, impacting both developed and developing countries worldwide. Economic consequences are as a result of drought globally. As alluded by Kellet & Sparks (2012), drought impacted about 1.5 billion people globally which led to food insecurity and serious economic damages. Globally, drought disasters occur much more frequently and it has an impact on the ecosystem for instance Lake Faguibine in Mali dried up and in Ghana most forests and agro-forests were destroyed (Lamizana, 2010).

Africa has experienced more catastrophic periods of drought as compared to other areas, and this is due to the vulnerability of both the people and their regions. As denoted by (Shiferaw et al., 2014), drought leads to food insecurity by undermining agricultural production and household income. Also another impact of drought is that it can lead to high mortality rate in livestock and also farmers might as well sell their livestock so that they cope with the drought, for example the drought of 1983/84 in the Sahel region, 75% of the herds died (Bader, 2011).

In the Southern Africa, the most region-wide drought was the 1991/92 drought which put the total number of affected people at 86 million with 20 million being considered at large risk of starvation (Gommes and Petrassi, 1994). People are also facing water shortages across the Southern Africa region as water sources are drying up due to high temperatures. This leads to waterborne diseases amid an ongoing cholera outbreak since late 2022 (Chaguza et al., 2024).

(FAO, 2019) states that in a period of three years farmers in the Southern African region were hit by drought for the second time and some parts of the region were severely affected during the 2015/16 years which led to food insecurity. The World Food Program (WFP) concurs that Zimbabwe experienced four droughts in the period of five years between 2015 and 2020 which impacted the country's food security.

Zimbabwe has faced approximately ten droughts from 1970 to 2004, placing it among the most affected countries (EM-DAT, 2011). Hisdal and Tallaksen (2000) note that droughts are common and significant, often resulting in more fatalities and economic damage than hurricanes, floods, tornadoes, and wildfires combined (Olaleye, 2010). Furthermore, unlike other hazards that occur suddenly, droughts develop gradually, are difficult to predict, and are not easily noticeable (Zamani et al., 2016).

Drought impacts nearly all climate zones, with over half of the planet experiencing drought conditions annually (Wilhite, 2000). These events can severely disrupt food production and often serve as a major catalyst for famine. Drought is a common and cyclical aspect of climate across various regions. Hagenlocher (2019) states that the risk of drought in any area depends on both the region's exposure to such events and the societal vulnerability to their effects.

Martinez-Sanchez (2010) suggests that the impacts of drought can linger for years after the event ends, affecting subsequent periods with normal or average rainfall. There is debate regarding the causes of drought. Sheffield and Wood (2008) argue that droughts are primarily natural phenomena, often resulting from extreme climate variations linked to events like the El Niño-Southern Oscillation (ENSO). In contrast, Bruntrup and Tsegai (2017) highlight that human activities, such as overgrazing, soil depletion, and poor land and water management, have increasingly contributed to drought risks, making them socially induced.

2.8 COPING MECHANISMS EMPLOYED IN THE MIDST OF DROUGHT

To mitigate the impact of drought, communities that have experienced prolonged dry conditions often create adaptive strategies (FAO, 1997). In West Sudan, peasant farmers adopted various traditional crops so that they can cope with frequent droughts (Hulme, 1984). According to Ruttenberg (1980), planting different crop varieties simultaneously lowers the likelihood of total crop failure, as the success of one can compensate for the failure of another and this practice is employed globally.As denoted by Jerie and Matanga (2012), in Zimbabwe this method of multiple cropping is done mainly in Mberengwa.

During drought situations, food intake patterns changes for instance the number of meals eaten is reduced and also increasing the intake of wild and famine foods. Murimi (1999) notes that the Community Technology Development Trust (CTDT) identified approximately 119 varieties of indigenous vegetables and 36 types of mushrooms as vital food sources during drought years in regions of Zimbabwe, including Murewa, Chiredzi, Nyanga, and Tsholotsho. Also there is another strategy of food preservation and storage like salting, fermenting food stuffs, sun drying for example the people in Botswana do use the method to maintain a reliable and nutritious food (Chenje, 1994).

According to UNEP (2002), individuals experiencing drought stress often have to sell livestock to afford grain. In Burkina Faso, the government implements a community storage strategy for food security through cereal banks managed by farmers. These banks allow farmers to buy and store grain right after the harvest and then sell it back to local villagers at reduced prices during droughts (FAO, 1997). Similarly, Zimbabwe has the Zunde RaMambo initiative, which operates on the same principle. Additionally, households affected by drought may migrate to other areas in search of better resources to cope with the impacts of dry conditions.

2.9 EFFECTIVENESS OF DROUGHT COPING MECHANISMS

Due to drought, coping mechanisms are devised but not all of them will be effective as some will be the least and other most effective. Roncoli (2001) noted that the approach of using drought-resistant crops is considered less effective due to limited access to these crops, which are primarily favored for beer production rather than for food consumption. Another less effective coping strategy is selling of livestock as it is not profitable, for example in Bikita, Zimbabwe the households sell their livestock at a lower price for a bag of maize (Munro, 2006).

Ngaka (2012) reports that, despite years of government drought relief efforts, analysis indicate a general agreement that this assistance has been ineffective and poorly coordinated, however the effectiveness of the government programmes leaves a lot to be desired. Multiple cropping is quite effective in coping with drought, providing a considerable degree of security, when some of the crops fail completely at least one other crop may succeed.

2.10 FOOD SECURITY

According to FAO (2001), food security is the condition in which all individuals have physical, social, and financial access to sufficient nutritious food that meets their dietary needs and preferences for a healthy and active lifestyle. Drought has a considerable effect on food security, especially in less developed countries and those with economies that depend heavily

on environmental resources. As a result, numerous development organizations around the world have called for the direct inclusion of drought concerns in comprehensive development plans intended to achieve sustainable development, which must include climate resilience, because of the complex connection between drought and food security (Anderson, 2019).

According to Rosegrant and Cline (2003), inadequate infrastructure and research, along with increasing water scarcity, are key factors leading to crop failures in various regions, raising food security issues globally in the twenty-first century. A United Nations report highlights that drought severely affects rain-fed agriculture in the Arab region, resulting in reduced yields and loss of vegetation in pastures, further threatening food security. Moreover, another effect of dryness that may reduce the amount of land covered by native plants is soil degradation (UN, 2015). Food security may face significant obstacles due to drought, hence agricultural systems must include adaptive strategies taking into account the harmful impacts of drought on food security as well as growing population and demand worldwide (Kumar, 2016).

2.11 FOOD SECURITY STATUS IN ZIMBABWE

The consequences of the drought in the 1990s on food security were somewhat complicated. Reduced agricultural output, increased food prices until 1993, and widespread crop failure were the main immediate effects of the drought in 1991–1992 on food security (Manatsa, 2013). In the meantime, the government launched a wide range of drought-relieving initiatives in 1991, such as kid supplemental feeding programs, food for work programs, and seed distribution. According to later assessments, these relief initiatives were successful in preventing severe food shortages caused by the drought (Hicks, 1993).

In 2008, during Zimbabwe's political and economic crisis, a household food security survey was conducted in Harare. The results indicated that households in low-income urban areas of Harare experienced much higher levels of poverty and food insecurity compared to those in ten other Southern African capitals (Brown, 2010). Tawodzera (2016) notes that while food security in Harare's low-income neighborhoods showed improvement in 2012 compared to 2008, the ongoing struggle to secure sufficient food remains a critical issue, highlighted by persistently high rates of severe food insecurity.

Food insecurity has not always existed in Zimbabwe. Around 2007, Zimbabwe's political and economic turmoil, together with natural calamities like droughts, severely damaged the country's food output. According to Crush (2016), due to significant disruptions to the retail marketing systems and commercial supply chain, the nation ultimately experienced food

shortages. Millions of people now rely on food aid, and Zimbabwe has grown to be a major importer of food items. The severe food insecurity has also been impacted by drought and a string of subpar crops.

2.12 RESEARCH GAPS

There is limited empirical data on how drought impacts subsistence farmers and rural households, such as those in Bindura rural district, who rely predominantly on farming for their livelihoods. Additionally, there is a knowledge gap regarding the adaptation and resilience strategies employed by rural households to cope with drought effects and to ensure access to adequate, nutritious food during such times. Research on the 2023/24 drought in Bindura is likely not yet available.

Additionally, there is a significant gap in empirical and academic research regarding government contingency plans aimed at ensuring food security for rural communities during droughts. Furthermore, there is a lack of literature on the role of public-private partnerships and the integration of indigenous and scientific knowledge in addressing food insecurity during these challenging times.

In addition, another area that needs more attention is drought research in general as it tends to be highly agriculture-centric. Indeed, agriculture bears a significant burden of the impact, particularly in economically developing countries like Zimbabwe where it is the most vulnerable sector, experiencing up to 80% of all direct impacts (FAO, 2017). AghaKouchak et al. (2015) and Xu (2021) emphasize the need for more research on how ecosystems and vegetation respond, noting that while studies on droughts and their extensive ecosystem effects have increased significantly (Bastos et al., 2020), further investigation is still necessary.

2.13 CHAPTER SUMMARY

This chapter examined theoretical literature concerning various livelihood issues, employing the Sustainable Livelihood Approach while discussing its strengths and weaknesses. It also analyzed drought, highlighting evidence at global, regional, and national levels. Additionally, the chapter addressed the impacts of drought on food security in Zimbabwe. Coping mechanisms for drought and their effectiveness were discussed, along with identified research gaps.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed literature on drought trends, the Sustainable Livelihood Theory, drought coping strategies, and food security. This chapter presents the methodology used in research. Saunders et al. (2023) define research methodology as a comprehensive plan that

details the processes and techniques for collecting, analyzing, and interpreting data, encompassing qualitative, quantitative, and mixed methods. This chapter begins with a description of the study area, followed by the research design, sampling strategy, data collection methods, and target population. It will also address ethical considerations relevant to the study and conclude with a summary.

3.2 DESCRIPTION OF THE STUDY AREA

The study was carried out in Bindura District, located in Mashonaland Province, Zimbabwe, due to the researcher's interest in this area. Mashonaland Central Province is notably one of the most productive regions in both agriculture and mining in Zimbabwe. Bindura has an estimated population of one hundred and sixty-nine thousand eight hundred, according to ZimStat in 2022. The population composition of Bindura is 89 620 females and 80 180 males.The town has seen significant population growth over the years, with a recorded population of 45,325 in 1996 (Census, 2012). This growth was further boosted by the establishment of Bindura University of Science Education and Zimbabwe Ezekiel Guti University, leading to an increase in the local population.

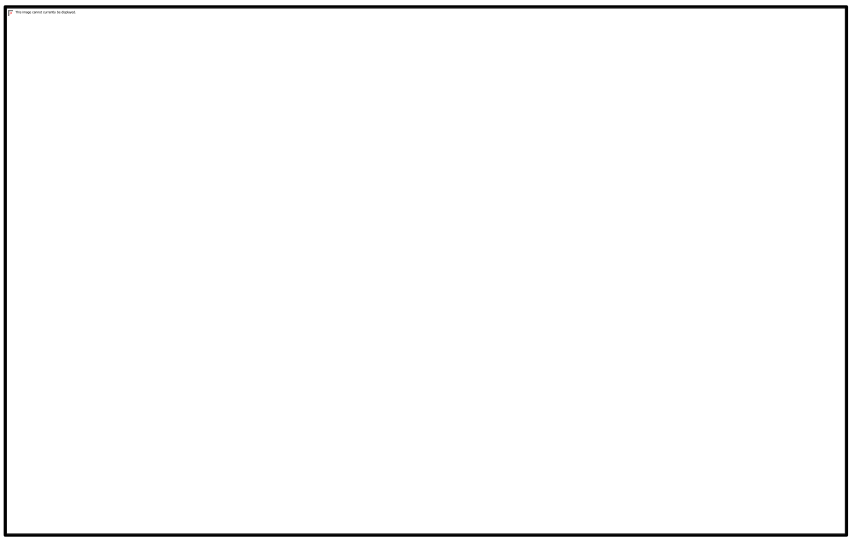

Figure 3.1 Map of the study area Bindura District (Majoni, 2018).

3.3 RESEARCH APPROACH

Lockster (2015) states that research design is defined as a procedure used to collect, analyse and interpret data. There are three approaches to which researchers can employ in research projects, that is, qualitative approach, quantitative approach and the mixed approach. The type

of approach to use in a project is influenced by data characteristics. This study adopted mixed approach.

3.3.1 MIXED APPROACH

A mixed-method study involves the researcher employing both qualitative and quantitative data collection and analysis methods within a single investigation (Cresswell, 1999). Adams (2012) defines qualitative approach as type of research that seeks non-numeric data and is mostly used to answer the 'why' and 'how' questions. Textual data can be sourced from various materials, including interviews, reports, and journals, and should be analyzed simultaneously with data collection (Natow, 2019). On quantitative research, he defined it as an approach that seeks to understand and use numeric data, statistical translations and relationships of data and is often used in natural and social sciences to investigate measurable aspects of the world. Quantitative methods are especially useful when qualitative data has been gathered in a structured manner, even if it originates from participatory discussions (SSC, 2001). They are valuable primarily when there is a requirement to summarize data across multiple iterations of a participatory process.

Using mixed approach enables a policy researcher to understand complex phenomena qualitatively as well as to explain the phenomena through numbers, charts, and basic statistical analysis. One major benefit of mixed methods research is its ability to provide a comprehensive understanding of the subject being studied. This is often achieved by combining qualitative insights with descriptive and quantitative data. When applied thoughtfully, these methods enable researchers to explore the issue from multiple, supportive perspectives.

3.4 SAMPLING DESIGN AND RESEARCH PARTICIPANTS

Sampling design refers to the approach used to choose a representative subset of individuals, items, or observations from a larger population (Creswell, 2022). In this study, a sample of 80 individuals was gathered, focusing on the formal sector, farmers, and residents from the informal sector in Bindura District. Employment type was chosen as a criterion for selecting respondents because these groups may be affected differently by drought and also different groups use different strategies to mitigate problems.

The researcher used stratified sampling method to select participants. Respondents were divided into groups based on relevant characteristic that is age, gender and employment type. This was to make sure that all the social groups are involved as they all are affected differently by drought. Purposive sampling was employed to select participants, as this method is straightforward and easy to implement.

This study utilized stratified sampling, which involves dividing respondents into groups (strata) based on specific characteristics such as gender, age, marital status, and location. This sampling method is the most favourable in distributing questionnaires because it reduces bias as respondents of all social/classified groups are considered, for instance, gender, age, marital status and level of education (thus socio-demography) (Mann, 2003). The study used age, gender and employment type in selecting respondents for data collection.

The second sampling method used in this study is purposive sampling.The purposive sampling method, also known as judgment sampling, involves selecting participants intentionally based on specific qualities they possess. This non-random approach does not require theoretical foundations or a predetermined number of participants (Alkassim, 2016). Purposive sampling is best criterion for selecting community leaders in participating on the research. Through cross validation, triangulation confirms the accuracy and reliability of the data (Njovu, 2020).

3.5 SAMPLING FRAME

A sampling frame refers to a list of specific cases that will be used to select a sample (Gill, 2010). Eighty (80) respondents were used for data collection through questionnaires. Two (2) local extension officers were interviewed to get in-depth information. However, Maoneni (2014) contends that a universal formula for determining sample size does not exist. The 80 respondents are chosen through stratified sampling method.

Employment Type	**Category**	**Gender**	**Number**
1. Formal Employment	Government	Male	10
2. Formal Employment	Government	Female	10
3. Formal Employment	Private	Male	10
4. Formal Employment	Private	female	10
5. Informal Employment	Non-Farmers	Male	10
6. Informal Employment	Non-Farmers	Female	10
7. Agriculture	Farmers	Male	10
8. Agriculture	Farmers	Female	10
Total			**80**

Table 1

3.6 SAMPLE SIZE

What matters is not the proportion of the research population sampled, but the absolute size of the sample in relation to the population's complexity, the researcher's objectives, and the statistical methods planned for data analysis (Yin, 2003). Larger samples tend to minimize bias, making findings more reliable (Gill, 2010). The proposed study will include 80 respondents. A designed questionnaire was used to collect answers from the questions. Headman/chiefs were used to respond to key informant interviews.

3.7 DATA COLLECTION PROCEDURE

The researcher received a confirmation letter from Bindura University of Science Education granting permission to conduct the research project. After obtaining this letter, the researcher approached the Bindura Town Council and other community leaders to seek approval for conducting research in their area. Appointments were scheduled for data collection.

Both qualitative and quantitative data were collected using questionnaires and key informant interviews. Respondents were given questionnaires to complete for data collection purposes. Key informant interviews were conducted specifically for leaders and extension officers. Before responding to questions, the researcher clearly explained the aims and technique for answering the questionnaires. During this period, questions were addressed to ensure that everyone fully understood the study's purpose and their expected contributions, helping to prevent irrelevant information from affecting the questionnaire responses. This procedure was used to improve data quality and accuracy. Continuous monitoring of respondents throughout data collection was used to avoid excessive errors and mistakes.

3.8 SOURCES OF DATA

A data source is defined as the origin or location from which data is collected for various purposes. There are two main types: primary data and secondary data. Primary data consists of firsthand information gathered by the researcher specifically for the study, directly from the source and never previously utilized. Examples of primary data sources include surveys, questionnaires, interviews, and focus groups. In contrast, secondary data is information obtained from existing sources, such as books, government publications, and online databases.

For this research, the researcher utilized primary data, collecting information through questionnaires and interviews in the Bindura district. Questionnaires were administered to 80 respondents and interviews to two extension officers. First-hand information was gathered from questionnaires as the respondents are the ones who have experienced the calamities of the 2023/24 drought and knows exactly how it impacted them and have first-hand information.

The importance of using primary data is its highest accuracy level as first-hand information is reliable and provides less distorted data. Collecting primary data allows the researcher to control the data collection process, and monitor the data quality and reliability for their analyses and conclusions hence the importance of primary data.

3.9 DATA COLLECTION METHODS AND INSTRUMENTS

Data was gathered through questionnaires and key informant interviews. Both methods aimed to reveal the impacts of the El Niño-induced drought in 2023/24 and the coping strategies used by communities to address the drought. The questionnaire included both closed and open-ended questions, allowing respondents to share their insights freely. Additionally, it contained standardized questions aligned with the research topic and objectives. Raw data was collected directly from the field to ensure accurate information regarding the issue at hand.

3.9.1 KEY INFORMANT INTERVIEWS

Marshall and Rossman (2006) suggest that interviews are a highly effective method for understanding individuals' perceptions, interpretations of situations, and their views of reality. Key informants, including knowledgeable community members and extension officers, were interviewed to provide insights. The data collected focused on their roles and responsibilities in the study area, the impact of the drought, and the coping strategies they observed during that period.

3.9.2 QUESTIONNAIRE

A questionnaire is a tool designed to gather and document information on a specific topic of interest, consisting of questions and space for responses (Hussain, 2022). The researcher administered 80 questionnaires in Bindura rural district to the respondents selected through stratified sampling method. The questionnaire had a section assessing the socio-demographic details, drought impact, coping mechanisms, food security status and then livelihood implications which is shown in appendix 1. The questions asked allowed the respondents to comment on their livelihood activities as well as food security status after the 2023/24 drought. The purpose of distributing questionnaires was to find out about the coping mechanisms aftermath the 2023/24 drought and how effective were the coping strategies. It is essential to

highlight that the questionnaires were self-administered to reduce bias. However, self-administering created a lot of work for the researcher since she was the only main actor.

3.10 DATA ANALYSIS

Data analysis is the process of systematically applying statistical or logical techniques to describe, summarize and compare data in order to extract meaningful insights and support decision-making (Creswell, 2018). Data on the coping mechanisms of drought and their implications on food security and livelihoods of Bindura residents was analysed. This was accomplished by inputting data into a database using Microsoft Excel. The data was then exported to the Statistical Package for Social Sciences (SPSS) for frequency and percentage analysis.

3.10.1 QUALITATIVE DATA

The qualitative data obtained from key informant interviews was documented. The recorded data or notes got transcribed, compared and conceptualised into thematic categories. Qualitative data was analysed thematically which involved identifying common themes or patterns in the data. Identified categories included the effects of drought on agriculture, coping strategies employed and their effectiveness, as well as the impact on food security and livelihoods. The analyzed data was interpreted in conjunction with the quantitative data results. Qualitative research was chosen due to the exploratory and inductive nature of the study, leading to findings that exceeded the researcher’s initial expectations.

3.10.2 QUANTITATIVE DATA

Quantitative data was gathered through printed questionnaires and analyzed using Microsoft Excel and SPSS. The findings were presented using descriptive statistics, including frequencies and percentages, which effectively summarize the dataset's characteristics.

3.11 ETHICAL CONSIDERATIONS

Ethical considerations involve the measures researchers implement to safeguard participants' rights, dignity, and welfare, while also ensuring integrity and honesty throughout the research process. Every place has its own rules thus ethical considerations hence the need to observe so that there is respect for the privacy by maintaining intellectual property rights.

The researcher approached the respondents for involvement because permission was granted. Participants received a brief overview of the study, its goals, and a commitment to anonymity and confidentiality prior to completing the questionnaire. Before starting the fieldwork, the researcher evaluated the research methods to ensure that no harm would come to the

respondents. This involved reviewing the research objectives and questions to confirm they would not cause offense, embarrassment, or discomfort. Having done this, the researcher then got permission from the institution, local authority as well as community leadership to legitimise the study.

Respondents were made aware that their participation was voluntary and that they could withdraw at any time without repercussions, ensuring their comfort. The researcher clearly communicated the study's purpose, confidentiality aspects, and required participants to sign a confidentiality indemnity form as a way of acknowledging their consent.

3.12 STUDY LIMITATION

The major constraint that the researcher faced are high expenses. Travel expenses from and to the study location were tallied. Printing costs are incurred because more than 90 questionnaires are necessary for collecting data. Miscellaneous expenses as the researcher traveled from point A to point B for data collecting, such as lunch.

Dishonest is another constraint faced in this study. Certain questions on the questionnaire, like those regarding daily meal consumption during droughts, might be perceived as sensitive or embarrassing, leading to potential non-disclosure from respondents. To address this challenge, the researcher emphasized that the study was conducted solely for academic purposes.

A limitation of the study is the issue of illiteracy, as many individuals in the informal sector lack education, which hinders their ability to read and write and access information. Due to the high degree of illiteracy, data collecting was challenging. Furthermore, illiteracy necessitates time consumption because the researcher had to assist respondents individually with either translation or filling the information, or both.

3.13 CHAPTER SUMMARY

This study employed a mixed-methods approach, integrating both quantitative and qualitative techniques. The chapter addressed various aspects, including research design, sampling methods, data analysis, instruments used, and a description of the study area. The chapter ended with explaining about ethical considerations as well as the study limitations.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

This section outlines the research methodology used to investigate coping strategies and their impacts on food security and livelihoods following the 2023/24 drought in Bindura District, this chapter focuses on the findings. These findings were obtained from the data which was gathered through key informant interviews and questionnaires. The presentation follows the research objectives and questions. As noted in chapter 3, this study utilized a mixed-method approach, with qualitative data analysed using themes and quantitative data in descriptive statistics.

4.2 DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

Information about the respondents' profiles was collected and assessed. The participants were categorized based on gender, age, marital status and education level. The subsequent tables as well as figures were used.

4.2.1 RESPONDENTS BY GENDER

Fig 4.1 shows illustrates the distribution of respondents by gender, showing the individuals who completed the questionnaire, with 40 male and 40 females.

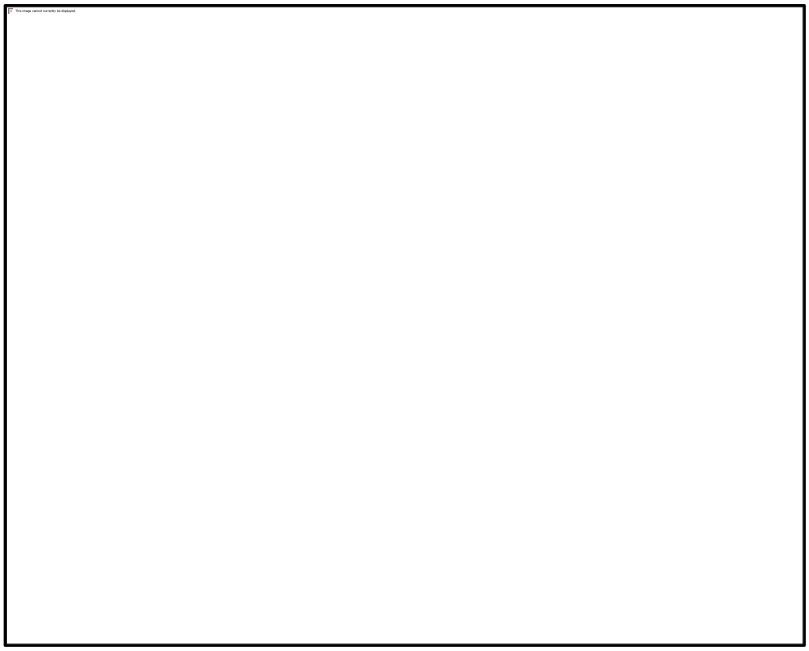

Figure 4.1 Gender of respondents.

4.2.2 AGE OF RESPONDENTS

Fig 4.2 indicates the age of the individuals. Most of the respondents (36) fell within the 31-40 age range. The age group 20 and below had the fewest respondents.

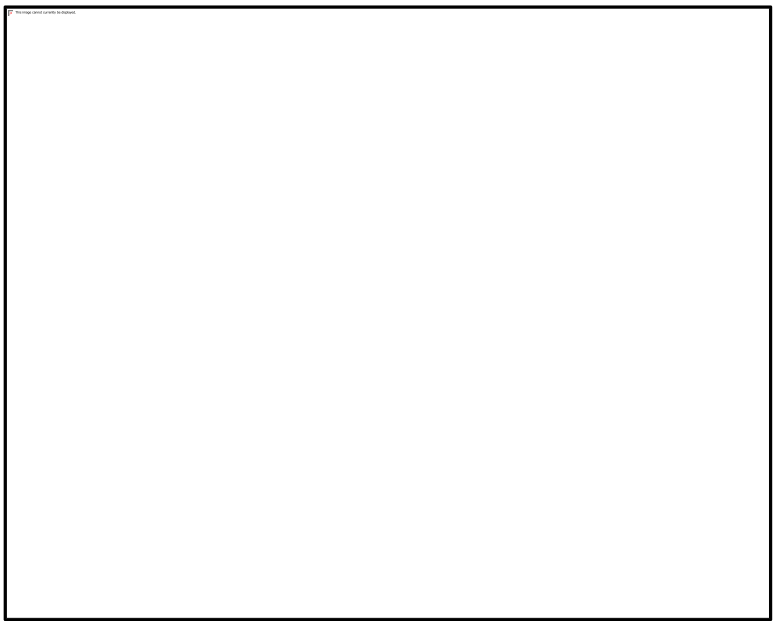

Figure 4.2 Age of respondents

4.2.3 MARITAL STATUS OF RESPONDENTS

Fig 4.3 shows the marital status of the participants. The graph depict that 57 were married, 7 were single, 13 widowed and 3 were the ones who were divorced.

Figure 4.3 Marital status

4.2.4 LEVEL OF EDUCATION OF RESPONDENTS

Results in fig 4.4 indicates that approximately 61 respondents (76.25%) attained a secondary education, 16 (20%) people reached tertiary and only 3 (3.75%) respondents had primary level.

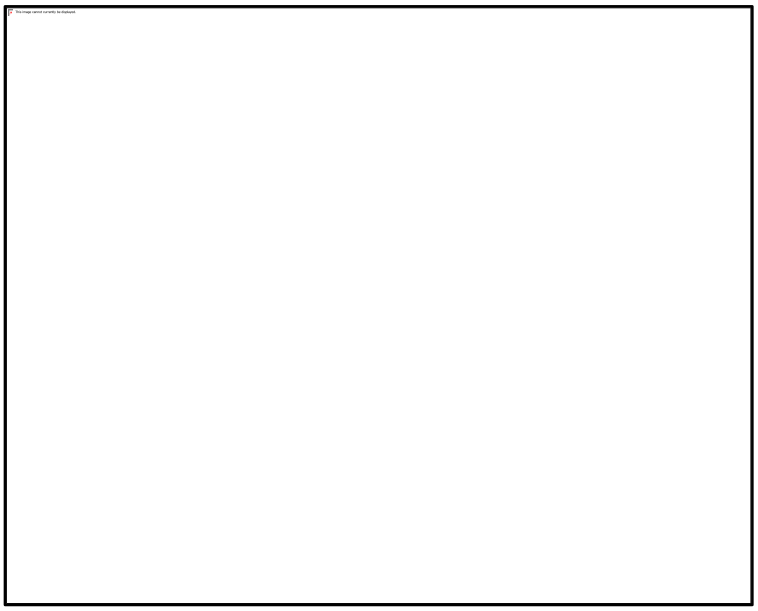

Figure 4.4 Education level

4.2.5 EMPLOYMENT TYPE

This study focused on the forms of employment of the participants. Fig 4.5 shows most of the respondents (50%) were in the formal sector (government), 25% were in the informal sector then the other 25% were farmers.

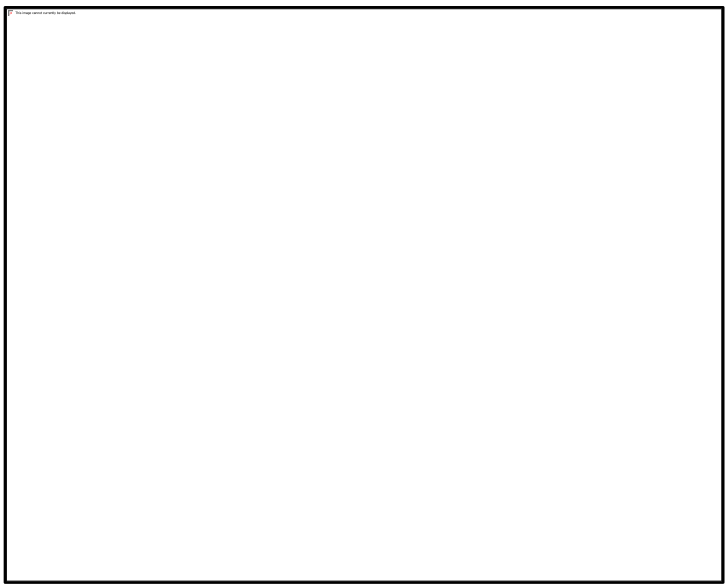

Figure 4.5 Employment type

4.3 Objective 1: IMPACT OF 2023/24 DROUGHT IN BINDURA DISTRICT.

The first objective of the study aimed to assess the effects of the 2023/24 drought in Bindura District. It focused on impact in terms of scale; on physical health, food consumption pattern both before and after the 2023/24 drought, on food security status and on sources of livelihood and livelihood activities.

4.3.1 IMPACT IN TERMS OF SCALE

The results which shows the scale are presented in fig 4.6. The results indicates various impact of drought, as severe, mild and moderate. As illustrated in Fig 4.6, most participants (76.25%) described the 2023/24 drought as severe. This is supported by the results from extension officers who pointed out that there was food insecurity due to crop failure, loss of agricultural income as well as severe water. However, other respondents (8.75%) described the impact of the drought to have been mild, with 15% describing the impact been it has moderate.

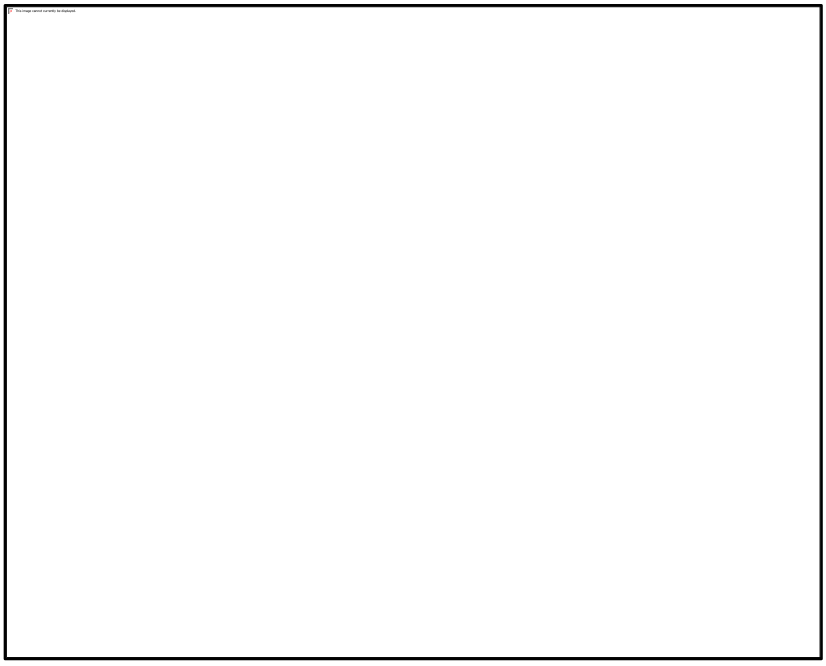

Figure 4.6 Impact of drought

4.3.2 IMPACT OF DROUGHT ON PHYSICAL HEALTH

Fig 4.7 represents 66.25% of the participants who said the results had moderate health impact meaning the drought caused malnutrition. 25% said it had minor health impact meaning the drought caused dehydration and fatigue due to slight reduction of food intake, temporary weight loss. However, 8.75% said it had no impact.

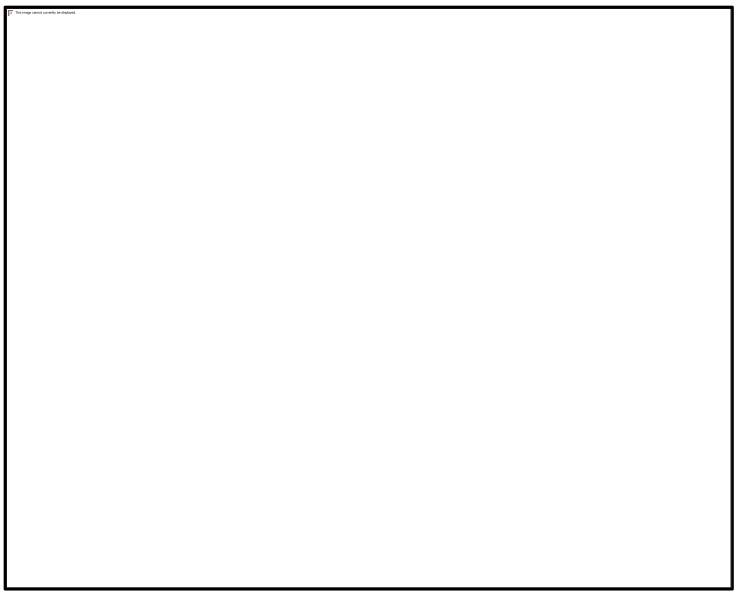

Figure 4.7 Impact of drought on physical health

4.3.3 IMPACT OF DROUGHT ON FOOD CONSUMPTION PATTERN.

The results revealed that food consumption patterns were most significantly impacted by drought with the answer yes which had the highest percentage of 96.25% and the answer no with 3.75% from respondents (Fig 4.8). Most respondents indicated that they did not have much variety to choose from.

"During the drought we only ate what was available at the time and we ate sadza with no relish or porridge with no sugar. And sometimes we could even eat unusual wild fruits, vegetables such as hacha".

35 year old lady – Bindura, Chipadze.

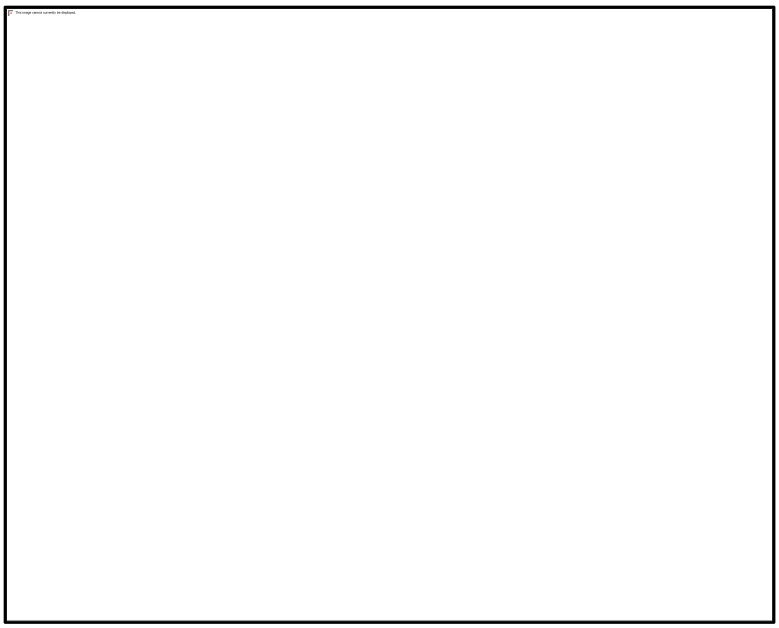

Figure 4.8 Food consumption patterns affected.

4.3.3.1 FOOD CONSUMPTION PATTERNS BEFORE THE 2023/24 DROUGHT.

Participants were initially asked to describe food consumption patterns before the 2023/24 drought. From fig 4.9, 40% showed that before drought they had meals three times a day, 57.50% reported having meals twice a day and 2.50% only had one meal a day.

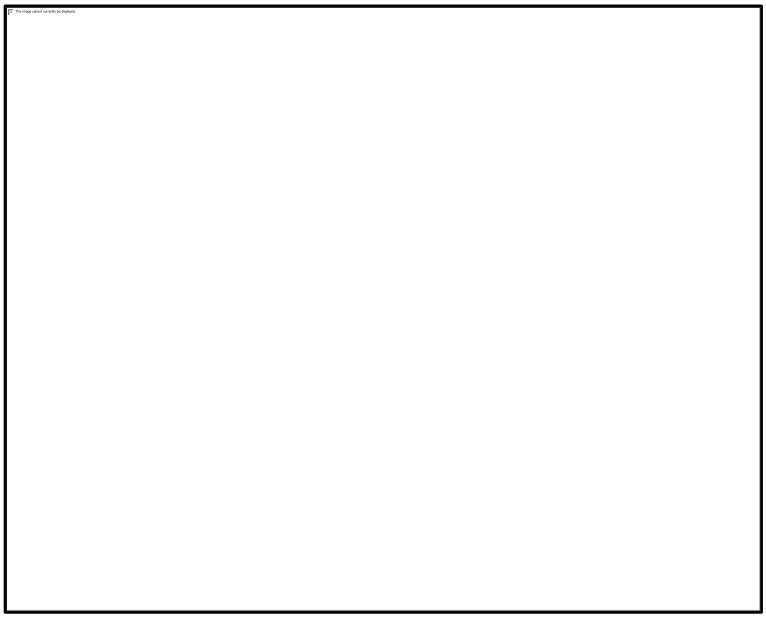

Figure 4.9 Consumption pattern

4.3.4 IMPACT OF DROUGHT ON FOOD SECURITY STATUS.

Participants were also asked about impact of drought on food security status. Fig 4.10 shows the results that about 78.75% were food insecure, 5% reported that they experienced severe food insecurity while 16.25% said they were moderately food secure. Results from key informants which were answered by the second extension officer indicated that the drought affected food security in Bindura were food prices skyrocketed leading to food insecurity which got the most high percent on fig 4.10.

"During and after the period of the 2023/24 drought, it affected us as we got most of our food from the farmer's market and because there was no rain meaning the farmer's market did not have anything to sell as well, and also purchasing in stores the prices increased which led to food insecure".

Man in his 40s – Bindura, Clusters

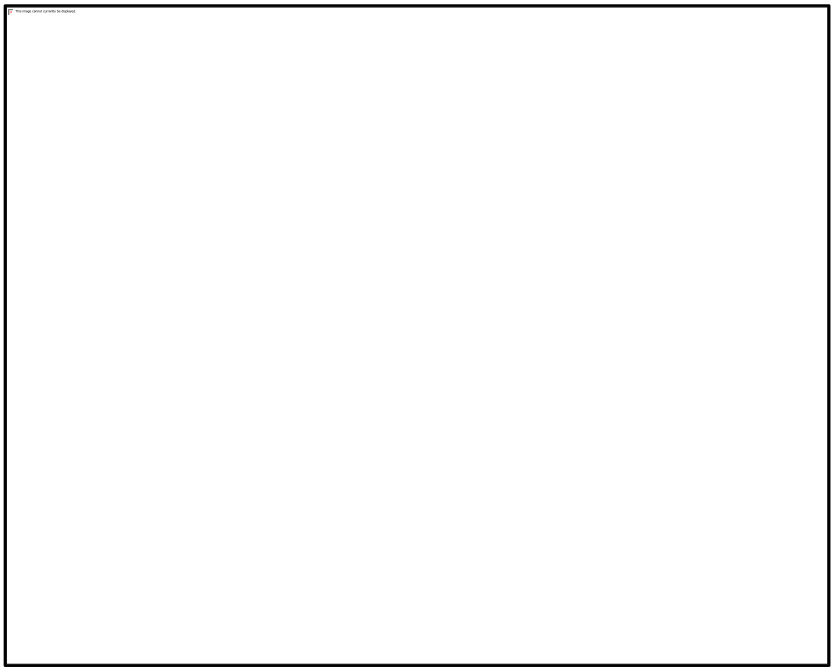

Figure 4.10 Food security status post-drought

4.3.5 IMPACT OF DROUGHT ON PRIMARY SOURCE OF LIVELIHOOD.

The study also aimed to investigate the drought's effects on primary livelihoods. On this, 37.5% said it reduced income, 43.75% said it reduced yield. Interview outcomes from one of the extension officers revealed that there was reduced yields as crops failed and also livestock deteriorated and died therefore the percent of reduced yields was high. There was also reduced

income from crop sales and reduced income from livestock sales. 15% respondents shifted to a different source of income towards short term options.

"Crops failed completely and what survived was not enough to feed households or to sell at the market. People could not make money from crop sales like they usually do that they even stopped farming and started selling airtime or doing informal work to survive". He went on to say, "*The losses were not just in the fields but livestock also suffered, goats, cattle, poultry deteriorated".*

Extension officer 1 – Manhenga, Bindura.

Source of income	**Percentage**
1. No change	3 (3.75%)
2. Shifted to a different source of income	12 (15%)
3. Reduced income	30 (37.5%)
4. Reduced yield	35 (43.75%)

Table 2

4.3.6 IMPACT OF DROUGHT ON LIVELIHOOD ACTIVITIES IN BINDURA DISTRICT.

The study also sought to determine whether livelihood activities were affected by the 2023/24 drought. From compiled data, 93.75% of the participants reported that livelihood activities were affected to a greater extent and 6.25% was a no (Fig 4.11). Results from the extension officers showed livelihood activities that were affected by the 2023/24 drought in Bindura District. These livelihood activities included horticulture, livestock farming, rain-fed crop cultivation. Many respondents were complaining from the effects they went through due to the 2023/24 drought in Bindura.

"My granary is empty and by this time last year, it would be full of maize and groundnuts. Now we are buying every bucket of mealie-meal and it is very expensive. We planted our

maize with hope, but the rains came too late and was little and now there is nothing to harvest or feed my family".

A woman in her 50s – Bindura.

"Our cattle are now so thin because the pastures and the river are all gone. We have already sold two cattle at low prices just so we can be able to buy food".

47 year old man – Bindura.

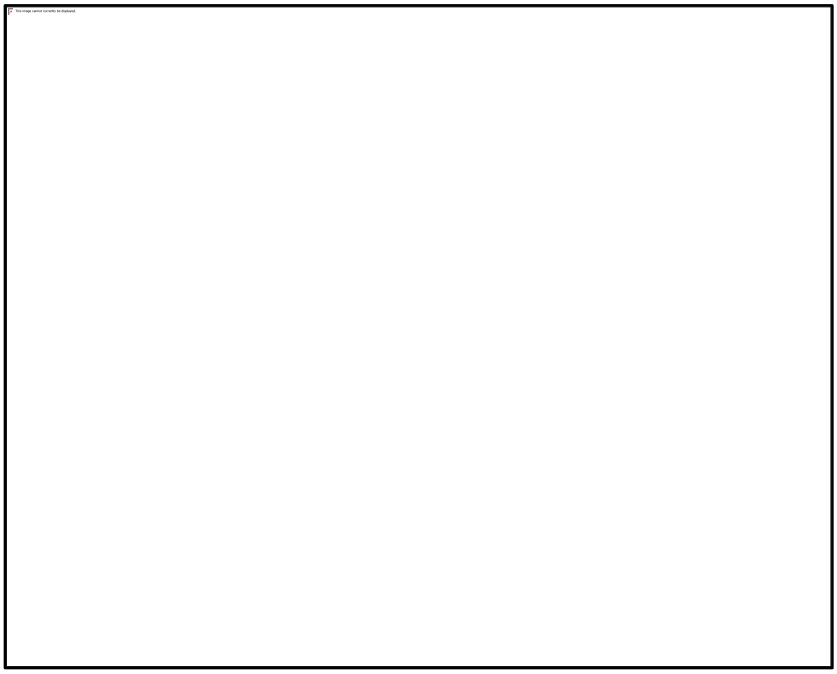

Figure 4.11 Livelihood activities affected

4.4 Objective 2: COPING STRATEGIES EMPLOYED IN RESPONSE TO THE DROUGHT.

Objective 2 focused on the coping mechanisms as response to the 2023/24 drought in Bindura District. The results of the coping strategies employed in response to drought are shown in table 4.1. As shown in the table below, most of the participants 37.5% indicated reduced food intake, 25% reported that they sold livestock, 15% reported that they ate unusual wild fruits, vegetables and other food stuffs. While 6.25% said they borrowed from neighbours and relatives, 3.7% of the participants said that they went the whole without food sometimes and 12.5% said they changed the farming methods. A participant during the collection of data was quoted saying:

"We used to eat more food because it was available but now due to this drought the portions have reduced, and also might even go the whole day without eating sacrificing for the young ones so that they have something to eat". They went on to say, *"pamwe pacho zvaitooma kusvika pakukumbira kuhama neavo vatinenge tichiona kuti vanazvowo" (It would get tougher sometimes and end up borrowing food from friends and relatives).*

Woman in her 40s – Bindura, Manhenga.

Coping strategies employed in response to the drought	**Percentage**
a) Reducing food intake.	30 (37.5%)
b) Selling livestock or assets.	20 (25%)
c) Go the whole day without food.	3 (3.75%)
d) Borrow from neighbours or relatives.	5 (6.25%)
e) Irrigation systems (drip irrigation)	12 (15%)
f) Community support	10 (12.5%)

Table 3

4.5 Objective 3: EFFECTIVENESS OF THE COPING STRATEGIES.

The third objective was to evaluate how effective the coping strategies employed in Bindura District were in alleviating drought impacts. The coping mechanisms were 70% somewhat effective, 28.75% not effective and 1.25% very effective. These results are backed up by the quotes derived from the key informant interviews which were responded by two extension officers in Bindura District.

Both extension officers indicated that the coping mechanisms such as water harvesting and drip irrigation was not exactly effective as access was limited. Also the extension officers indicated about the issue of selling livestock as a coping mechanism which people employed but the officers stated that the move of selling livestock depleted assets.

"We noticed that selling livestock was a good strategy that people could use to survive, but the problem is once you sell your animals, you are left with nothing for the future".

Extension officer 1 – Trojan, Bindura.

"*Drip irrigation is good in theory, in practice it did not work well as most farmers could not afford the setup or the training on how to use it".*

Extension officer 2 – Manhenga, Bindura.

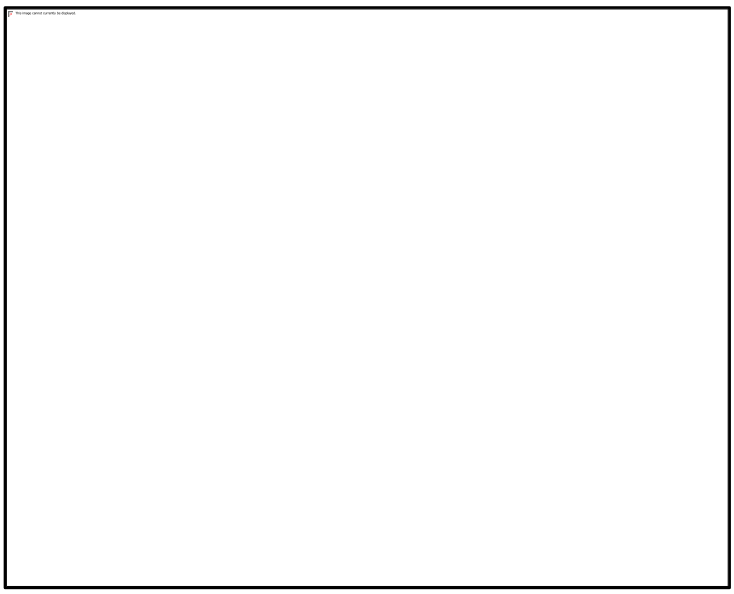

Figure 4.12 Effectiveness of the coping mechanism

4.6 CHAPTER SUMMARY

This chapter four concentrated on the key findings from both the household surveys and the key informant interviews with the extension officers in Bindura District. The main goal was to understand how the 2023/24 drought affected people's lives, how they tried to cope and what that means for food security and livelihoods. The chapter began by looking at the demographic information of the respondents then it examined the impacts of drought. Coping mechanisms followed by how these coping mechanisms were effective was also indicated. Food security before and post-drought was looked at again and also the effects of drought on the livelihoods of these respondents. Finally, the chapter shared insights from two local extension officers who work closely with farmers.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

The previous chapter focused on showcasing the results, raw data. This chapter summarizes the key findings of the research and it aims to go deeper by interpreting those results and connecting them to real world issues. The chapter states the key findings followed by a comparison with other similar studies. It also indicates the implications of these findings.

5.2 DEMOGRAPHIC INFORMATION

Most participants were in the age range of 31 to 40 years, with a dominant representation of married individuals and head of households. Most had attained secondary education and half were employed in the formal sector. The demographic findings in this research are consistent with those reported by Sibanda et al (2020), who observed that on age and gender individuals in their 30s and 40s are often the most economically active and hence are most engaged in farming and other livelihood activities vulnerable to climatic shocks.

Although most of the respondents reached secondary level it did not translate into the adoption of advanced adaptation strategies. This suggests a gap between formal education and practical knowledge in climate resilience and it also points the lack of vocational training focused on sustainable farming and disaster preparedness. Almost half of the respondents were household heads meaning decisions on coping strategies occur at the household level, highlighting the need to engage household decision-makers in awareness initiatives, microloans and agricultural extension support.

Though gender responses were equal in this study, research from similar contexts such as from Mugambiwa and Tirivangasi (2017), shows women often carry the burden during climate shocks, including sourcing water and caring for children. While this study did not explore gendered impacts deeply, the equal representation presents an oportunity for future gender-sensitive analysis.

5.3 IMPACTS OF THE 2023/24 DROUGHT

The 2023/24 drought had severe impacts on households, and physical health was also moderately affected mainly through malnutrition, dehydration and fatigue. Over 76% of respondents in this study reported severe impacts reflecting similar findings by Mupakati and Tafara (2019), who documented that over 70% of households in Masvingo Province experienced crop failure and livestock loss due to prolonged dry spells.

Malnutrition, dehydration and fatigue reported in this study also echo trends from the studies in Southern Zimbabwe where droughts have led to spikes in health vunerabilities (Tirivangasi, 2018). With 78.75% of respondents reported as food insecure, the area is at risk of persistent hunger and malnutrition. Drought-induced crop failure and livestock loss reduce both food availability and purchasing power limiting household resilience to future shocks. The reduction in agricultural yield and income due to the drought signifies an erosion of rural livelihoods where many families were forced to abandon farming.

The 2023/24 drought is an environmental shock that negatively affected agricultural production, food availability and health. It aligns with the sustainable livelihood framework's (SLF) idea that people's ability to survive and thrive is shaped by shocks like drought (Scoones, 2015). Families were forced to skip meals, sell their livestock and even go days without food, and this showed how vulnerable households are to drought shocks.

5.4 COPING MECHANISMS EMPLOYED IN RESPONSE TO THE DROUGHT.

In this study the common coping strategy was reducing food intake followed by selling livestock or assets. However only 1.25% found their coping strategy to be very effective with most rating them as somewhat effective with 70%. The results found were similar to the study which was done by Mavhura (2017) and Ndhlovu et al (2021), which stated that households in drought-affected areas in Zimbabwe and Kenya adopted consumption based coping mechanisms such as reducing food portions or skipping meals. Such mechanisms often signal distress and are not sustainable, and also prolonged undernourishment increases the risk of chronic malnutrition especially among children, pregnant wome and the elderly. Also going an entire day without food may lead to long-term cognitive and physical health effects.

Coping strategies like reducing food intake, selling livestock and shifting to other sources of income reflect short-term survival tactics rather than long-term adaptation and this aligns with sustainable livelihoods framework which examines how people use their assets to respond to challenges. The fact that 1.25% found the strategies very effective highlights their unsustainability which sustainable livelihood framework warns about.

5.5 FOOD SECURITY

In the aftermath of the 2023/24 drought, 78.75% of households were food insecure and the majority reported that their food consumption patterns were negatively affected. According to Chitongo and Munyati (2019), drought in Zimbabwe resulted in deteriorated food access, increased food prices and more reliance on humanitarian aid. This is consistent with this study where 78.75% of respondents were found food insecure.

The results from this study present critical implications under food security were reduced food intake may lead to vulnerability where chronic undernutrition may worsen especially among children and pregnant women. Also food security on this study is comparable to that reported in Beitbridge and Gwanda by Matondi and Chikulo (2017), where up to 80% of households were unable to access three meals a day during the El Nino- induced drought.

5.6 LIVELIHOODS POST-DROUGHT

The drought severely disrupted livelihoods with 93.75% affirming its impact and it reduced agricultural yields and income leading to some shifting income sources. A study by Maphosa and Sibanda (2020) in rural Matebeleland found that droughts disrupted income sources and forced farmers to diversify or abandon agriculture paralleling this study's findings. Reduced yields and income indicate that households' economic resilience is deteriorating. This increases dependency on aid and limits long-term development prospects.

Though sustainable livelihood framework (SLF) looks at final results which include increased income, reduced vulnerability, enhanced food security and sustainable resource management, in this study outcomes were largely negative and some turned to short-term strategies but few managed to achieved positive or sustainable outcomes.

5.7 DISCUSSIONS ON EXTENSION OFFICERS (KEY INFORMANTS)

To compliment the quantitative data of this study, key informants interviews were conducted with two agricultural extension officers who work directly with farmers in Bindura District. Their insights helped shed light on the practical realities that households face, especially in crop production and livestock management during the 2023/24 drought. Both officers confirmed that the drought hit hard and that crops like maize, millet, sorghum, beans suffered widespread failure due to poor rainfall and prolonged dry spells. Also livestock such as cattle, goats, poultry were severely affected too.

The extension officers observed that farmers tried several things to cope and these included water harvesting, drought resistant crops, drip irrigation and mulching. While some strategies showed promise, others like drip irrigation were not very effective in Bindura District and it was largely due to a lack of infrastructure, financial resources. Their comments painted a picture of resilience but also one of trial and error where farmers are doing their best but often without the necessary tools. When asked about the government's support during the drought, both extension officers indicated that the distribution of aid was poorly coordinated. They expressed that while policies exist on paper, actual implementation on the ground is often delayed of underfunded.

5.8 CHAPTER SUMMARY

This discussion chapter extended beyond mere statistics and charts and it focused on the human experiences behind the data and what these results tell us about life. The chapter begins with restating the key findings. After that, there was the comparison of these findings to other studies in Zimbabwe and across the region. The chapter also examined the study's implications then went on to discuss about what the extension officers had to say.

CHAPTER 6

SUMMARY, RECOMMENDATION AND CONCLUSION

6.1 INTRODUCTION

This chapter provides a summary and conclusions of the findings. Besides also, presenting relevance of the theoretical framework, limitation of the study, it also outlines policy recommendations based on the findings and highlights areas for further research. It is essential to recognize that the purpose of this study was to evaluate the coping strategies used and their impact on food security and livelihoods following the 2023/24 drought. The specific objectives were:

1. To identify effects of the 2023/24 El-Nino-induced drought in Bindura District?
2. To investigate the coping mechanisms employed by the communities of Bindura District in the midst of the 2023/24 drought.
3. To analyse the effectiveness of the coping mechanisms employed in Bindura District in mitigating the effects of drought and enhancing food security and livelihoods.

Chapter 1 pointed out that the results of this study would be of interest to various actors such as policymakers. The study is important to policymakers because it may guide them on creating effective interventions that enhance community resilience, investigating how communities adapt to drought conditions which can reveal resilience strategies that may be applied in other regions facing similar challenges. This understanding can help in developing frameworks for future drought preparedness.

6.2 STUDY SUMMARY

In line with the mixed approach paradigm that is relevant to the study such that there is in-depth analysis of the problem being faced. The study employed a mixed-method approach, incorporating both qualitative and quantitative data. The researcher utilized a stratified sampling technique to choose participants and these were divided into groups based on relevant characteristic that is age, gender and employment type. Purposive sampling was also used to select respondents because participants are selected due to the qualities they possesses such as leadership. The primary methods used to collect data were questionnaires and key informant interviews.

6.3 RESULTS SUMMARY AND CONCLUSIONS

This section aims to summarize the results that emerged from each objective as well as to make conclusions.

i. Objective 1: Effects of the 2023/24 drought in Bindura District

The 2023/24 drought had severe impacts on physical health, food security and the livelihoods of Bindura's residents. A significant majority of respondents reported the drought to be severe leading to widespread food insecurity. Many people faced food insecurity and some experienced malnutrition and dehydration. The drought drastically altered food consumption patterns with participants noting a reduction in meal variety and frequency. Many reported skipping meals and the overall agricultural productivity declined, negatively affecting livelihoods.

This concludes that the 2023/24 drought hit Bindura District hard and had devastating effects, severely impacting food security and the health of many people. A lot of people reported food insecurity and it is clear that the drought did not just affect crops, but it made it difficult for families to access food.

ii. Objective 2: Coping mechanisms employed in the midst of the drought

To cope with the harsh conditions caused by the 2023/24 drought, the communities in Bindura District employed several strategies. The common strategies included reducing food intake, selling livestock and borrowing from neighbors. Many respondents expressed feelings of desperation often sacrificing their own meals to ensure their children had something to eat. The reliance on unusual food stuffs such as wild fruits and vegetables reflected the dire situation faced by the people.

In conclusion, responding to these challenges faced, communities adopted various coping strategies and while many tried to make it by reducing food intake and selling livestock, these measures often were not sustainable. Many went hungry so that their children could eat and also they could turn wild fruits and vegetables into edible foods just to get by.

iii. Objective 3: Effectiveness of the coping mechanisms employed in Bindura District in mitigating the effects of drought and enhancing food security and livelihoods.

The coping mechanisms employed were found to be largely ineffective in the long term, meaning to say they were not sustainable. While most respondents rated their strategies as somewhat effective, only a very few deemed them very effective. This highlights the unsustainable nature of these coping strategies which often involved short-term survival tactics rather than long-term adaptations. The study revealed that while some strategies like selling livestock provided immediate relief, they ultimately depleted resources needed for future resilience. The extension officers which were interviewed noted that although some coping methods were used, many lacked the necessary infrastructure to be truly effective.

It concludes that most coping mechanisms were ineffective in the long run and left families vulnerable. The reliance on immediate solutions instead of sustainable practices shows the need for better support to help these communities adapt to such environmental shocks.

6.4 RELEVANCE OF THE THEORETICAL FRAMEWORK

As pointed out in Chapter 2, the research was based on the sustainable livelihood framework (SLF). Stated by Cherutich (2012), this framework argues that many organizations have employed the sustainable livelihoods approach to examine how individuals can utilize their resources to maintain their living conditions and enhance their understanding of livelihood strategies. Sustainable livelihoods theory is important because in relation to the study, it is used to understand how El Nino-induced drought coping strategies affect livelihoods and food security. The theory looks at how drought induced disasters affect people's livelihoods and tries to pinpoint coping strategies.

a. LIMITATION OF THE STUDY

While the research concentrated on coping strategies following the 2023/24 drought and their effects on food security and livelihoods in Bindura District, as well as the drought's overall impacts, there are some areas that were not dealt with. It could have also focused on the history of the EI Nino induced drought in the area, adaptation to drought disasters.

b. POLICY RECOMMENDATIONS

a. The study's findings indicated that the drought led to a decrease in agricultural production and low income, prices skyrocketing leading to food insecurity, therefore the government should enforce detailed drought response methods that includes immediate relief efforts for example food aid and financial support. Assistance in

finance like loans with low interest rates and also helping with distributing food is crucial for families to recover and rebuild after a drought.

b. The results indicated that there was reduced crop yields as well as loss of livestock due to drought. However, the government should focus on training farmers in sustainable practices and providing assess to drought-resistant seeds and technologies. Farmers can be taught techniques that conserve water and improve soil health for example crop rotation and also ensuring farmers have access to drip irrigation and given seeds that are drought resistant.

The results showed that there was greater impact in Bindura District due to the 2023/24 drought and it would have been little impact if the communities knew more on what to do when facing drought. Therefore, the government should raise awareness and educate people about global warming, drought and its effects on agriculture and food security and this can empower them to take measures in case it does happen in the future. This could involve community workshops, school programs and social media outreach. By sharing data and stories on how drought affects local farms and food prices, people can be inspired to take action and support policies that promote sustainability.

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APPENDICES

APPENDIX 1, QUESTIONNAIRE

Hello, my name is Ashley Davis a final year student at Bindura University of Science Education pursuing an undergraduate degree in Development studies. I am carrying out a research on the coping mechanisms in the aftermath of the 2023/24 drought and their implications on food security and livelihoods.

My aim in this study is to assess the coping mechanisms employed and their effects on food security and livelihoods in the aftermath of the 2023/24 drought using Bindura District as a case study. The questions used in this document will only be used for this research study and all the information gathered in this document will be confidential. To ensure confidentiality, your names will not be recorded.

You are kindly advised to answer all the questions on this document.

Date of interview-..../…./…. Questionnaire Number-…….

A. DEMOGRAPHIC INFORMATION (TICK WHERE APPROPRIATE)

1. What is your gender?

MALE	FEMALE

2. What is your age?

Below 20 years	20-30 years	31-40 years	41-50 years	Over 50 years

3. a. What is your marital status?

1. Married	
2. Single	
3. Widowed	
4. Divorced	
5. Other (Specify)	

b. Household Position?

5. Head of Household	
6. Father	
7. Son	
8. Daughter	
9. Others, e.g. Grandkids	

4. Level of education

Primary	Secondary	Tertiary

Employment Type

Formal	Informal	Farmers

Household Number. **Note:** Remember household members are people who usually live in your house and share meals with you.	

B. IMPACT OF THE DROUGHT

4. How would you rate the impact of the 2023/24 drought on your household?

No impact	
Mild impact	
Moderate impact	
Severe impact	

5. What specific challenges has your household faced due to the drought? (Select all that apply)

Food shortages	
Loss of livestock	
Increased food prices	
Decreased crop yields	
Other (Do specify)	

6. How has the drought affected your physical health or that of your family members?

No impact	
Minor health issues e.g dehydration, fatigue	
Moderate health issues e.g malnutrition.	
Severe health issues e.g chronic conditions, hospitalization.	

C. COPING MECHANISMS

1. Which coping strategies has your household employed in response to the drought? (select all that apply)

Reducing food intake	
Selling livestock or assets	
Go the whole day without food	
Borrow from neighbors or relatives	

Eat unusual wild fruits, vegetables and other food stuffs	
Changed farming methods and crops types	
If any other please add:	

2. How effective do you find these coping mechanisms?

Very effective	
Somewhat effective	
Not effective	
Unsure	

D. FOOD SECURITY STATUS

1. How were your food consumption patterns before the 2023/24 drought?

Once per day	Twice per day	Three times or more per day

2. How would you describe your household's food security status post-drought?

Food secure	
Moderately food secure	
Food insecure	
Severely food Insecure	

3. Were your food consumption patterns affected by drought?

YES ☐ NO ☐

If **YES,** what were your consumption patterns from the start of the drought in 2023 to 2024?

2023-2024	**Once per day**	**Twice per day**	**Three times per day**	**Zero sometimes**
October				
November				
December				
January				
February				
March				
April				
May				
June				

July				
August				
September				
October				
November				
December				

E. LIVELIHOOD IMPLICATIONS

2. Did drought affect your livelihood activities?
   YES ☐ NO ☐

3. How has your primary source of livelihood changed due to the drought?

No change	
Shifted to a different source of income	
Reduced income	
Reduced Yield	
If any other please add:	

4. What support or resources would help improve your household's situation? (select all that apply)

Financial assistance	
Access to food aid	
Agricultural training	
Access to water resources	
If any other please add:	

THANK YOU.

APPENDIX 2

KEY INFORMANT INTERVIEW GUIDE

The questions below will be answered by extension officers

1. Can you please describe your role as an extension officer in Bindura District. (Responsibilities and duration in the position).

   ……
   ……
   ……

2. a(i). Did drought affect animal husbandry in your area?

   YES ☐ **NO** ☐

   a(ii). If yes, which animals were affected by the drought?

   ……
   ……

   a(iii). How were animals affected by the 2023/24 drought?

   ……
   ……
   ……
   ……

   b(i). Did drought affect crop production in your area?

   YES ☐ **NO** ☐

   b(ii). If yes, which crops were affected by the drought?

   ……
   …….

   b(iii). How were crops affected by the 2023/24 drought?

   ……
   ……
   ……
   ……....

3. (i). What coping mechanisms have you observed among farmers in response to the drought pertaining animal husbandry?

   ……
   ……

   (ii). What coping mechanisms have you observed among farmers in response to the drought pertaining crop production?

   ……
   ……
   ……

4. (i). How effective do you believe these coping mechanisms have been for farmers on crop production?
   ……
   ……
   ……
   ……
   (ii). How effective do you believe these coping mechanisms have been for farmers on livestock production?
   ……
   ……
   ……
   ……
5. In your opinion, how has drought affected food security in Bindura District?
   ……
   ……
   ……
   ……
   ……
6. What support services have farmers most commonly requested in the aftermath of the drought?
   ……
   ……
   ……
7. How effective have the government responses been in providing support to the affected communities?
   ……
   ……
8. What could have been done to mitigate the impacts of 2023/24 drought in Bindura District?
   ……
   ……
   ……

   SIGNATURE

   …….

THANK YOU.

APPENDIX 3, PERMISSION LETTER

SCHOOL OF GEOLOGICAL SCIENCES, DISASTER & DEVELOPMENT

SUSTAINABLE DEVELOPMENT DEPARTMENT

BINDURA, ZIMBABWE
WhatsApp : +263773281212
E-mail: jbowora@buse.ac.zw

BINDURA UNIVERSITY OF SCIENCE EDUCATION

CHAIRPERSON'S OFFICE

Thursday 03 April 2025

TO WHO IT MAY CONCERN

Dear Sir or Madam

RE: RESEARCH SUPPORT LETTER FOR SUSTAINABLE DEVELOPMENT STUDENT

I am writing on behalf of the Sustainable Development Department requesting your collaboration on the research of our fourth-year student, DAVIS ASHLEY **REGISTRATION NUMBER** B210623B.

The student is studying for a 4-year Bachelor of Science (Honours) Degree in Development Studies (HBSc.DG). During the fourth year of study, students are required to do field research which require them to do their data collection for research purposes.

We will be highly obliged to furnish you with additional information about the research project if our request meets your favorable consideration.

Yours faithfully,

Dr. J. Bowora
(Chairperson)

CHAIRMAN
GEOGRAPHY DEPARTMENT
FACULTY OF SCIENCE

MUNICIPALITY OF BINDURA

All Communications To
Be Addressed To The
TOWN CLERK
P O Box 15,
BINDURA
ZIMBABWE

565 Thurlows Avenue
Bindura, Zimbabwe
Phone: 6430/6453/7391-4

Our ref: S4/0003
Your ref:

06 May 2025

Ashley Davis
Bindura University of Science Education
BINDURA

Dear Madam,

RE: PERMISSION TO CARRY OUT AN ACADEMIC RESEARCH PROJECT

We acknowledge receipt of your letter on the above received on 02 May 2025.

Please be advised that you have been granted permission to carry out your research as requested. The permission is granted on the following conditions: i) that you should share the results of your research with Council in order for her to learn from your findings ii) that the research findings will be used for academic and no other purposes.

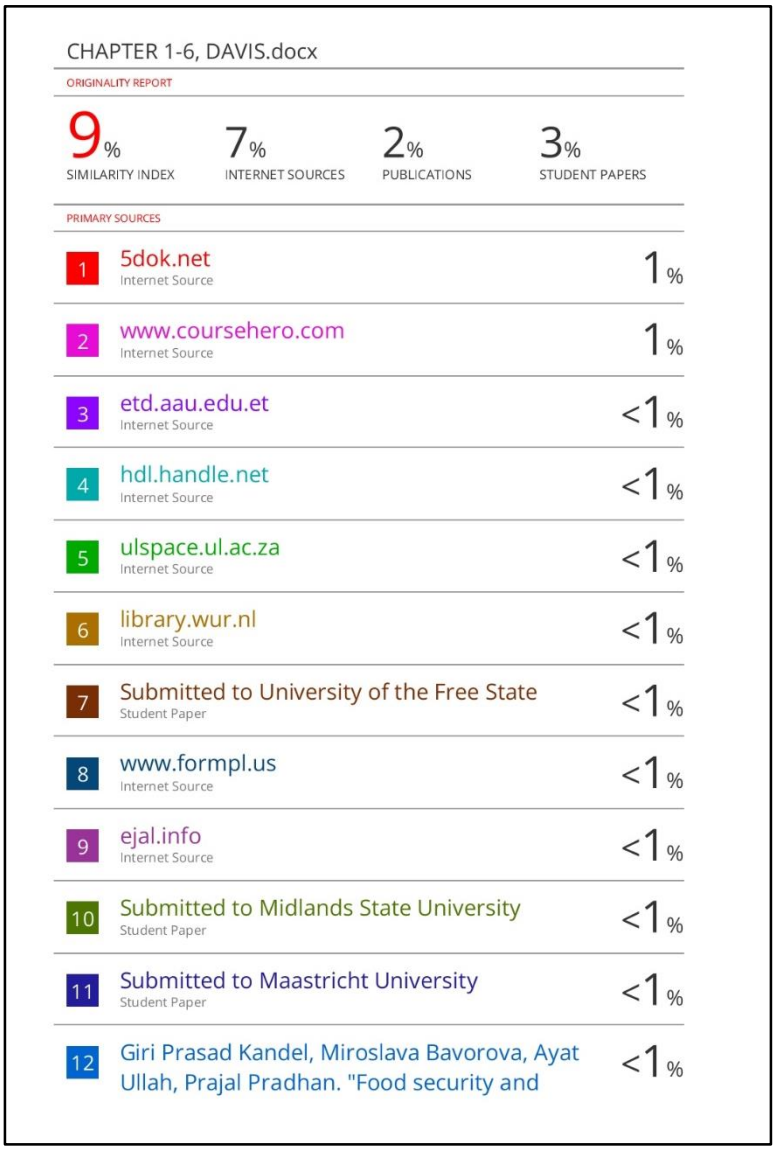
Should you require any more information in connection with this issue please contact the undersigned.

Yours Faithfully

W. Masimba
Chamber Secretary
For Town Clerk

MUNICIPALITY OF BINDURA
CHAMBER SECRETARY
09 MAY 2025
P.O. BOX 15, BINDURA
TEL: 066210 7513/7518/7361
SIGNATURE:

APPENDIX 4, SIMILARITY INDEX



CHAPTER 1-6, DAVIS.docx

ORIGINALITY REPORT

9%	7%	2%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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