TOPIC: ASSESSING THE RESILIENCE OF RURAL FOOD SYSTEMS IN THE EL NINO INDUCED DROUGHT IN MASVINGO, CHIVI, AND GURUVE DISTRICTS, ZIMBABWE BETWEEN 2023/24: A GENDERED PERSPECTIVE. FOCUS ON AGRICULTURAL PRODUCTION AND FOOD AVAILABILITY.

A dissertation submitted in partial fulfilment of the requirements for the Master of Science Degree in Food Security and Sustainable Agriculture
(PRODUCTION)

Bindura University of Science Education

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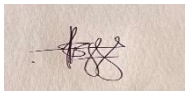
Signed  …….

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DECLARATION

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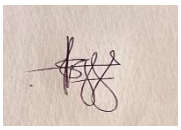

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DEDICATION

This work is dedicated to my beloved family, whose unwavering support and encouragement made this journey possible. To my mother Thamali Kopeni whose values of resilience, hard work, and faith continue to inspire me each day—this is for you. Your sacrifices gave me the strength to keep going, even during the most challenging moments.

And to the countless rural women and men in Zimbabwe who quietly endure the hardships of climate shocks—may this study contribute in some small way to improving your lives and making your voices heard.

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ABSTRACT

This study investigates the gendered resilience of rural food systems to the 2023/24 El Niño-induced drought in three drought-prone districts of Zimbabwe: Masvingo, Chivi, and Guruve. The primary objective was to explore how men and women differently experience, respond to, and recover from climate-induced shocks within rural agricultural settings. A mixed-methods approach was employed, comprising household surveys (n = 198), three focus group discussions (FGDs), and seven key informant interviews (KIIs) with agricultural and community stakeholders.

The findings reveal persistent gender disparities in access to agricultural resources, decision-making power, and livelihood opportunities. Women were heavily involved in farming tasks yet lacked ownership of land, access to credit, and participation in agricultural planning. During the El Niño drought, both genders experienced decreased agricultural productivity; however, logistic regression analysis confirmed that being female significantly increased vulnerability. Women were more likely to suffer food insecurity due to limited mobility, constrained income sources, and increased caregiving burdens, especially as men migrated in search of work.

Coping mechanisms were highly gendered: women predominantly engaged in localized, survival-based strategies such as food-for-work, rationing, and selling small livestock, while men relied on asset liquidation and labor migration. Institutional support systems were found to be inconsistent, politically biased, and often inaccessible to women. Despite the emergence of temporary shifts in household roles, these changes were crisis-driven and did not necessarily translate into long-term empowerment.

The study concludes that building gender-equitable resilience in rural food systems requires not only technical interventions but also structural reforms that dismantle systemic inequalities. Key recommendations include gender-responsive agricultural policies, improved access to climate adaptation training, and inclusive safety nets that target female-headed households. The study contributes to the growing body of evidence advocating for gender-transformative approaches in climate resilience and rural development strategies.

Keywords: System Resilience, El Niño Drought, Gender Inequality, Rural Agriculture and Coping Strategies

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Full Meaning
AGRA	Alliance for a Green Revolution in Africa
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
GoZ	Government of Zimbabwe
IPCC	Intergovernmental Panel on Climate Change
KII	Key Informant Interview
NGO	Non-Governmental Organization
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
UN	United Nations
WFP	World Food Programme
ZimStat	Zimbabwe National Statistics Agency
ZimVac	Zimbabwe Vulnerability Assessment Committee

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Chapter 1.0: Introduction

1.1 Background of the Study

Food system resilience refers to the capacity of food systems to absorb, recover from, and adapt to shocks and stressors, while continuing to deliver access to sufficient and nutritious food. It is a multifaceted concept involving agricultural productivity, socio-economic stability, and environmental sustainability. Climate change, particularly extreme weather events such as droughts, presents a significant threat to food system resilience globally. The El Niño phenomenon, characterized by abnormal warming of ocean temperatures, is among the most disruptive climate events, leading to prolonged droughts in many regions. These droughts destabilize agricultural systems, undermine food security, and exacerbate vulnerabilities among rural populations (FAO, 2022). Rural food systems are the cornerstone of livelihoods for millions of people in developing countries, particularly in sub-Saharan Africa. These systems encompass the production, distribution, and consumption of food, often relying heavily on smallholder farming. However, they are increasingly threatened by climate change, which has intensified the frequency and severity of extreme weather events such as droughts. Among these, El Niño-induced droughts pose significant challenges, disrupting agricultural production, reducing food availability, and deepening food insecurity. In Zimbabwe, where agriculture accounts for a significant share of the economy and rural livelihoods, the vulnerability of food systems to drought is a growing concern. The country's dependence on rain-fed agriculture, combined with socio-economic challenges, limits the ability of rural households to cope with climate-induced shocks. Women, who play a central role in food production and household food management, are particularly vulnerable due to systemic inequalities in access to resources, land, and decision-making structures. This gendered dimension of food system resilience has significant implications for understanding how households respond to and recover from climatic shocks. This study investigates the resilience of rural food systems in Zimbabwe to the 2023/24 El Niño-induced drought, focusing on gendered household coping mechanisms. By exploring how men and women experience and respond to these climatic challenges, the research aims to provide insights for strengthening food system resilience and promoting gender-sensitive interventions.

Food security remains one of the most pressing challenges in Zimbabwe, particularly in rural areas where livelihoods are heavily dependent on agriculture. Agriculture contributes approximately 17% to Zimbabwe's GDP and employs nearly 60% of the population, most of whom are smallholder farmers (ZimStat, 2021). However, the sector is highly vulnerable to climatic shocks, particularly droughts induced by the El Niño phenomenon. The 2015/16 El Niño-induced drought resulted in a 42% decline in maize production and significant livestock losses, leaving over 4 million people food insecure (FAO, 2019). The 2023/24 El Niño event had similar or even more devastating effects.

While much research has focused on climate adaptation strategies such as climate-smart agriculture, drought-resistant crops, and improved irrigation, these approaches often overlook the social and gendered dimensions of food insecurity. Women, despite contributing over 60% of agricultural labor in Zimbabwe, own less than 15% of agricultural land and have limited access to resources such as credit, inputs, and extension services (FAO, 2022). As a result, they are disproportionately affected by drought, with fewer opportunities to adapt effectively.

Gendered inequalities in rural food systems influence how men and women experience and respond to climatic shocks. Women are primarily responsible for food preparation and household food security, yet their access to critical resources and decision-making platforms remains constrained (Mutopo, 2014). During droughts, they bear the burden of increased workloads, including fetching water from distant sources and managing dwindling food supplies, while men may migrate in search of alternative income sources.

Despite these gendered impacts, policy interventions in Zimbabwe have largely taken a one-size-fits-all approach to drought resilience, failing to account for the specific vulnerabilities and adaptive capacities of men and women. Understanding these disparities is crucial to developing targeted, effective, and inclusive solutions that build resilience in rural food systems. Without addressing these gender-specific vulnerabilities, efforts to achieve Sustainable Development Goals (SDGs) 1 (No Poverty), 2 (Zero Hunger), and 5 (Gender Equality) may be significantly delayed, if not entirely unattainable.

This study seeks to fill this critical knowledge gap by examining how men and women experience and respond to El Niño-induced droughts differently within Zimbabwe's rural food systems. The findings will provide evidence-based recommendations for gender-sensitive interventions that enhance food security and agricultural resilience.

1.2 Problem Statement

The resilience of food systems—their ability to absorb, recover from, and adapt to climatic shocks—is essential for ensuring food security, particularly in drought-prone rural areas. While many studies have explored technical and economic solutions to strengthen food system resilience, there remains a critical knowledge gap in understanding the gendered dimensions of vulnerability and adaptation within rural food systems. Existing research has not adequately addressed the differences in how men and women experience and respond to climate-induced food insecurity, nor how these disparities influence long-term resilience strategies.

In Zimbabwe, recurrent El Niño-induced droughts have exacerbated food insecurity, disproportionately affecting rural households that dependent on rain-fed agriculture. Women, who play a central role in food production and household food management, face systemic barriers such as unequal land ownership, restricted access to financial resources, and exclusion from decision-making structures (FAO, 2022). As a result, they are often left with fewer adaptive options during droughts, leading to increased food insecurity, malnutrition, and economic instability.

Recent studies indicate that women-headed households are particularly vulnerable. For instance, over 70% of female farmers in Zimbabwe rely on rain-fed agriculture, making them more susceptible to drought-induced crop failures (ZimVac, 2021). Furthermore, women in rural households spend an average of 4.5 more hours per day than men on unpaid care work, including food preparation and water collection (Mutopo, 2014). These factors limit their ability to engage in alternative income-generating activities or access adaptation resources.

The lack of gender-sensitive approaches in food system resilience not only exacerbates immediate food insecurity but also has long-term implications for sustainable development. If gender disparities are not addressed, Zimbabwe risks delayed progress toward SDGs 1, 2, and 5, as well as continued inefficiencies in policy interventions aimed at improving food security.

This study aims to bridge this gap by providing an in-depth analysis of gendered vulnerabilities and adaptive capacities within Zimbabwe's rural food systems. By examining the specific challenges faced by men and women, this research will offer evidence-based recommendations for policy reforms, targeted interventions, and inclusive strategies that enhance food security and resilience in the face of climate-induced shocks.

Failure to address these gendered disparities will lead to persistent food insecurity, ineffective adaptation strategies, and the exclusion of women from critical resilience-building efforts.

Through this study, policymakers, development practitioners, and community leaders will gain essential insights needed to develop more inclusive and sustainable food system interventions.

1.3 Objectives of the Study

1.3.1 Main Objective

To assess the resilience of rural food systems to the 2023/24 El Niño-induced drought in Zimbabwe, focusing on agricultural production, food availability, and gender-specific dynamics.

1.3.2 Specific Objectives

1. To assess the effect of the El Niño-induced drought on agricultural production and food availability.
2. To examine the gendered effects of the drought on rural food systems, focusing on challenges and coping mechanisms in agricultural production.
3. To identify and analyze coping mechanisms used by rural households to maintain food security during the drought.
4. To recommend gender-sensitive interventions and policies for strengthening rural food systems.

1.4 Research Questions

1. What is the impact of the 2023/24 El Niño-induced drought on agricultural production and food availability in rural Zimbabwe?
2. How do gender dynamics influence the challenges and coping mechanisms in rural food systems during drought conditions?
3. What coping mechanisms are employed by rural households to maintain food security during the drought?
4. What gender-sensitive interventions and policies can enhance the resilience of rural food systems to droughts?

1.5 Hypotheses

1. The El Niño-induced drought has a statistically significant negative affected the agricultural production and food availability in rural Zimbabwe.
2. Women face disproportionately greater challenges compared to men in coping with drought-related impacts on rural food systems.

3. Rural households employing diverse coping mechanisms are more likely to maintain food security during the drought.

1.6 Justification

Understanding gendered vulnerabilities in rural food systems is essential for designing effective climate adaptation strategies. By integrating a gender perspective, this study will:

- Provide empirical evidence on the specific challenges faced by men and women in agriculture during climate-induced droughts.
- Inform policymakers on the need for gender-sensitive agricultural policies, ensuring equitable access to resources and climate adaptation programs.
- Contribute to the achievement of SDGs 1 (No Poverty), 2 (Zero Hunger), and 5 (Gender Equality) by promoting inclusive approaches to food security and resilience.
- Guide development practitioners and humanitarian agencies in designing targeted interventions that enhance resilience and reduce food insecurity in drought-prone rural areas.
- Highlight the role of cultural norms and institutional frameworks in shaping adaptive capacities, ensuring that future climate policies address these structural challenges effectively.

1.7 Scope /Delimitations and Limitations

Geographical Scope: This study focused on selected rural districts in Zimbabwe that were significantly affected by El Niño-induced droughts. The research examined agricultural production, food security, and gender-based coping mechanisms in communities that primarily depended on rain-fed agriculture. These regions included Masvingo, Chivi, and Guruve districts, known for their vulnerability to climate shocks and their reliance on subsistence farming.

Thematic Scope: The study explored gender disparities in food system resilience, specifically examining:

- The differential impacts of drought on men and women in terms of food security, livelihood sustainability, and agricultural productivity.
- The social, economic, and cultural factors that shaped gendered responses to drought.
- Gender-specific access to land, finance, and agricultural extension services.
- Coping mechanisms employed by men and women to maintain household food security during drought periods.
- Policy recommendations for gender-sensitive climate adaptation strategies.

Delimitations:

- The study focused solely on rural food systems and excluded urban food supply chains.
- The research analyzed the 2023/24 El Niño-induced drought and did not account for long-term climatic patterns beyond this event.
- Data collection prioritized direct interviews, surveys, and focus group discussions with rural households, excluding national policymakers based in urban centers.

Limitations

While this study aimed to provide a comprehensive understanding of gendered food system resilience, certain limitations affected its scope and findings:

- Data Availability: Some historical data on gendered food security trends were limited, requiring reliance on self-reported information from respondents.
- Cultural Sensitivities: Gender-related discussions were influenced by social norms, potentially affecting the openness of participants, particularly women.
- Time Constraints: The study was conducted within a defined research period, limiting the ability to track long-term adaptation strategies beyond the immediate drought effects.
- Logistical Challenges: Accessing remote communities for data collection was hindered by poor infrastructure, necessitating alternative data collection methods such as phone interviews in certain cases.

Despite these limitations, the study employed rigorous data collection and analysis methods to ensure the reliability and validity of findings.

1.8 Outline of the Thesis

This research was structured into five key chapters:

- Chapter One: Provided an introduction, background of the study, problem statement, research objectives, questions, hypotheses, significance, scope, and delimitations.
- Chapter Two: Presented a comprehensive literature review on climate resilience, gendered food security, and coping strategies in rural agricultural systems.
- Chapter Three: Outlined the research methodology, including study design, sampling techniques, data collection methods, and ethical considerations.
- Chapter Four: Focused on data presentation, analysis, and interpretation of results concerning gendered food security and drought resilience.
- Chapter Five: Concluded with key findings, policy recommendations, and potential areas for further research.

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Chapter 2: Literature review

2.1 Introduction

This chapter reviews existing literature on the impact of El Niño-induced droughts on food production, the gendered effects of drought on rural food systems, and the coping strategies employed by men and women in affected communities. Additionally, it explores policy interventions designed to gender-sensitive climate resilience. The literature review is structured to highlight the disparities in vulnerabilities and adaptation mechanisms, emphasizing the need for inclusive policies and targeted interventions that ensure equitable access to climate adaptation resources. By analysing existing studies, this chapter establishes the foundation for assessing how men and women navigate drought-related challenges and how these gendered experiences shape overall food system resilience. The review also identifies key research gaps that this study aims to address, providing critical insights into the intersection of climate change, food security, and gender equity in Zimbabwe's rural communities.

2.2 Brief Literature

2.2.1 Impact of El Niño-induced Drought on Agricultural Production and Food Availability

El Niño-induced droughts have historically disrupted agricultural production and food supply chains, posing a significant threat to rural livelihoods and national economies. These climatic events, characterized by prolonged dry spells and irregular rainfall patterns, have led to widespread crop failures, livestock losses, and declining food availability. In Zimbabwe, the 2015/16 El Niño drought resulted in a 42% decline in maize production, forcing the government to import over 800,000 metric tons of maize to stabilize food supplies (FAO, 2019). Given that maize is the country's staple crop, this disruption had devastating consequences for food security, particularly in rural areas reliant on subsistence farming.

Smallholder farmers, who make up the majority of Zimbabwe's agricultural workforce, were disproportionately affected due to their dependence on rain-fed farming and limited access to irrigation infrastructure. Studies indicate that over 70% of smallholder farmers experienced crop failure during severe droughts, exacerbating food shortages and increasing rural poverty levels (ZimVac, 2021). Additionally, the reduced availability of animal fodder led to widespread livestock mortality, further diminishing household incomes and food sources.

Food availability in rural communities was further constrained by market disruptions, as local food supply chains became less reliable due to declining agricultural output. Research shows

that food prices surged by over 30% during the 2015/16 drought, making it difficult for low-income households to afford essential commodities (WFP, 2016). Women-headed households, which often had lower purchasing power, were particularly vulnerable, facing heightened risks of malnutrition and food insecurity.

The impact of El Niño-induced droughts extended beyond food production, affecting water resources essential for both irrigation and household consumption. As water sources dried up, the cost of irrigation increased, making it inaccessible for many smallholder farmers. Consequently, the reliance on rain-fed agriculture became an even greater risk factor for food system stability.

While various adaptation strategies, such as promoting drought-resistant crops and conservation agriculture, have been implemented in Zimbabwe, the success of these initiatives has been uneven due to structural constraints such as limited farmer education, financial barriers, and unequal access to agricultural inputs (FAO, 2022). Addressing these challenges requires comprehensive, gender-sensitive interventions that improve farmers' capacity to adapt to climate-induced food production shocks.

2.2.2 Gendered Effects of El Niño-induced Drought on Rural Food Systems

The effects of El Niño-induced droughts have not been gender-neutral, as men and women have experienced different vulnerabilities and adaptation challenges. Women, despite contributing over 60% of agricultural labor, have had limited access to land, credit, and extension services, which has constrained their ability to implement effective adaptation strategies (FAO, 2022). Studies have highlighted that women-headed households were 30% more likely to experience severe food insecurity compared to male-headed households (Mutopo, 2014).

Traditional gender roles have further exacerbated these disparities. During drought periods, women have taken on increased household responsibilities, including food rationing, water collection, and childcare, while men have often migrated to urban centers in search of alternative income sources (Chiweshe & Mutopo, 2020). This increased workload for women has further reduced their economic participation and ability to invest in climate-resilient farming practices.

Moreover, socio-cultural norms have continued to restrict women's access to productive resources, limiting their ability to adopt climate adaptation strategies. Research indicates that only 15% of women in Zimbabwe own agricultural land, despite their significant contribution

to food production (FAO, 2022). This lack of ownership has hindered their access to credit facilities, as land tenure is often a prerequisite for securing agricultural loans. Consequently, women have been disproportionately affected by food shortages, with fewer resources to support long-term recovery from drought-induced losses.

Additionally, the nutritional impacts of drought have been particularly severe for women and children. Studies have shown that women are more likely to reduce their food intake during drought periods to prioritize feeding children and elderly family members (ZimVac, 2021). This coping mechanism, while ensuring household food distribution, has led to increased cases of malnutrition and micronutrient deficiencies among women in drought-affected regions.

Despite these challenges, women have played a crucial role in sustaining food security through innovative adaptation strategies such as small-scale gardening, food preservation, and participation in informal trade. However, these efforts have often been undermined by structural inequalities, which have limited their ability to scale up and institutionalize their resilience mechanisms.

The gendered effects of El Niño-induced droughts underscore the need for targeted interventions that promote equitable access to resources, financial support, and decision-making opportunities. Without addressing these disparities, efforts to build resilient food systems in rural Zimbabwe will remain incomplete.

2.2.3 Coping Mechanisms and Strategies Used by Rural Households During Drought

Rural households have employed various coping strategies to mitigate the impact of El Niño-induced droughts, but the effectiveness of these strategies has varied based on socio-economic status and gender. Many of these mechanisms were short-term survival responses, while others aimed at long-term resilience building.

One of the most common coping strategies was adjusting consumption patterns. Households often reduced meal sizes, skipped meals, or prioritized feeding children over adults. Research showed that over 65% of rural households in Zimbabwe reported eating fewer meals per day during severe droughts (ZimVac, 2021). Women, as primary caregivers, were particularly affected, often reducing their own food intake to ensure that children and elderly family members had enough to eat.

Livelihood diversification was another widely adopted strategy. Men frequently migrated to urban areas or neighboring countries in search of alternative income sources, leaving women

to manage agricultural activities and household responsibilities (Chanza & de Wit, 2016). Women, in response, turned to informal trade, small-scale food processing, and casual labor to supplement household income. However, these income-generating activities were often unstable and failed to provide long-term financial security.

Social support networks played a crucial role in cushioning the effects of drought. Many households relied on extended family, neighbours, or community-based food-sharing arrangements to access food during critical periods (FAO, 2019). In some communities, women formed self-help groups where they pooled resources to buy food collectively or provided small loans to each other for business ventures.

In agriculture, some farmers adopted drought-tolerant crops such as millet and sorghum, which required less water than maize. However, the uptake of these crops remained limited due to market preferences for maize, lack of agronomic knowledge, and inadequate extension services (WFP, 2016). Additionally, conservation agriculture techniques, such as mulching and minimum tillage, were promoted to enhance soil moisture retention, but adoption rates were inconsistent across communities.

While these coping mechanisms provided short-term relief, studies showed that repeated reliance on them eroded household assets and long-term resilience. For example, many households resorted to distress sales of livestock, depleting their financial safety nets and making recovery from future droughts even more difficult. Women, in particular, faced greater barriers in accessing formal support systems, as relief programs often failed to consider their specific needs and constraints (FAO, 2022).

Overall, while rural households demonstrated remarkable adaptability in the face of drought, structural barriers such as limited access to credit, inadequate agricultural extension services, and persistent gender inequalities hindered their ability to implement sustainable resilience strategies. Addressing these challenges required targeted interventions that not only supported short-term survival but also built long-term adaptive capacity for both men and women in rural communities.

2.2.4 Gender-Sensitive Interventions and Policies to Strengthen Rural Food Systems

Addressing the gender disparities in food system resilience required targeted interventions and policy frameworks that ensured equitable access to resources, decision-making power, and adaptation support. While some policies had been introduced to mitigate the effects of El Niño-induced droughts, their impact remained limited due to poor implementation, lack of gender sensitivity, and exclusion of marginalized groups.

One of the most critical interventions was improving women's access to land and credit. Studies indicated that only 15% of women in Zimbabwe owned agricultural land, significantly limiting their ability to access loans and invest in climate-resilient farming practices (FAO, 2022). Policies that promoted joint land ownership and streamlined credit access for women farmers were essential in addressing this disparity. Microfinance institutions and government-backed credit schemes needed to prioritize women to enable them to adopt sustainable agricultural practices.

Integrating gender-responsive budgeting in climate adaptation programs was another crucial intervention. Research suggested that climate funds were often allocated without considering gender-specific vulnerabilities, resulting in women receiving inadequate support for adaptation initiatives (Chiweshe & Mutopo, 2020). Budgetary allocations that specifically targeted women-led agricultural enterprises and training programs could enhance their resilience to climate-induced shocks.

Strengthening agricultural extension services was vital in bridging the knowledge gap in climate adaptation. Women often had less access to agricultural training and extension services compared to men, which affected their ability to implement drought-resistant farming techniques (IPCC, 2022). Developing gender-inclusive training programs and increasing the number of female agricultural extension officers could improve knowledge dissemination and technology adoption among women farmers.

Scaling up social protection programs was another effective approach to mitigating the gendered effects of drought. Cash transfer programs, food aid, and targeted subsidies for women-headed households had been shown to improve food security outcomes (Chanza & de Wit, 2016). However, existing social protection programs needed better targeting mechanisms to ensure that the most vulnerable groups, particularly rural women, received adequate support.

Enhancing women's participation in policy and decision-making was a long-term intervention that could lead to more inclusive climate resilience strategies. Women remained largely

underrepresented in local governance structures, agricultural cooperatives, and climate policy discussions, limiting their influence in shaping adaptation policies (FAO, 2019). Promoting gender-balanced leadership in agricultural decision-making bodies and ensuring that women's voices were considered in climate adaptation planning were essential for achieving sustainable change.

Despite these policy recommendations, challenges remained in implementation. Many gender-sensitive policies lacked clear accountability mechanisms, leading to weak enforcement and continued marginalization of women in climate adaptation efforts. Strengthening institutional frameworks and ensuring multi-stakeholder collaboration between governments, NGOs, and local communities was crucial in ensuring that gender-responsive policies translated into tangible outcomes.

By addressing these structural barriers and implementing gender-sensitive interventions, rural food systems could become more resilient to future climate shocks, ensuring sustainable food security and equitable adaptation strategies for both men and women.

2.3 Conceptual / Theoretical Framework

The conceptual framework for this study was designed to analyze the gendered dimensions of food system resilience in the face of El Niño-induced droughts. It integrated multiple interrelated components, including climate variability, gendered vulnerabilities, coping strategies, and policy interventions, to assess how men and women navigated climate-induced food insecurity differently.

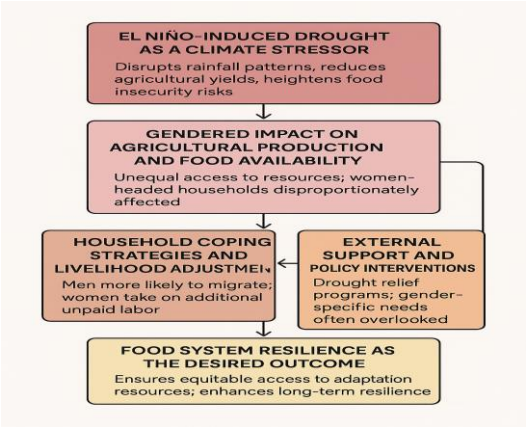

Figure 1: Conceptual Framework

Key Components of the Conceptual Framework:

1. El Niño-Induced Drought as a Climate Stressor:

El Niño disrupted rainfall patterns, reduced agricultural yields, and heightened food insecurity risks. Smallholder farmers, particularly those relying on rain-fed agriculture, were most affected.

2. Gendered Impact on Agricultural Production and Food Availability:

Women and men had different levels of access to resources such as land, credit, technology, and training, affecting their ability to cope with drought. Women-headed households were disproportionately affected due to structural barriers limiting their adaptive capacity (FAO, 2022).

3. Household Coping Strategies and Livelihood Adjustments:

Men were more likely to migrate to urban centres in search of alternative livelihoods, whereas women took on additional unpaid labor at home. Households adjusted food consumption, diversified income sources, and relied on social networks for survival (ZimVac, 2021).

4. External Support and Policy Interventions:

Government and non-governmental organizations implemented drought relief programs, but many failed to consider gender-specific needs. Social protection mechanisms, including food aid and cash transfers, played a crucial role in mitigating food insecurity but needed to be more inclusive and sustainable.

5. Food System Resilience as the Desired Outcome:

A gender-sensitive approach to food security would enhance resilience by ensuring equitable access to adaptation resources. Strengthening institutional support for women farmers, promoting climate-smart agriculture, and improving participation in decision-making structures were key to achieving long-term food system resilience.

Visual Representation: A conceptual framework diagram was developed to illustrate these interactions, demonstrating how El Niño-induced droughts triggered gender-specific vulnerabilities and coping mechanisms within rural food systems. The framework provided a

structured approach for assessing policy effectiveness and the role of gender in shaping climate adaptation outcomes.

This framework guided the research by ensuring a comprehensive and systematic analysis of gender disparities in food system resilience, informing recommendations for sustainable and equitable adaptation strategies.

1. Sustainable Livelihoods Framework (SLF)

The Sustainable Livelihoods Framework (SLF), developed by the UK Department for International Development (DFID), offers a holistic approach to understanding how households use different types of assets—natural, physical, human, social, and financial capital—to build resilience and pursue livelihood strategies under conditions of vulnerability (DFID, 1999). The framework highlights the influence of external shocks (such as droughts), trends, and seasonality on livelihood outcomes and emphasizes the mediating role of institutions and policies.

In the context of this study, the SLF is instrumental in analyzing how rural households in Zimbabwe's drought-prone regions manage their agricultural production and food availability during El Niño-induced shocks. It provides a lens through which to examine how access (or lack thereof) to key livelihood assets—such as land, water, credit, and information—shapes the ability of households to adapt and remain food secure. By mapping out the capitals households depend on, the SLF helps explain differences in adaptive capacity and coping strategies across communities.

2. Gender and Development (GAD) Theory

The Gender and Development (GAD) theory emerged as a critique of earlier Women in Development (WID) approaches, shifting focus from women's inclusion to a deeper interrogation of gendered power relations (Rathgeber, 1990). GAD views gender as a social construct and examines how roles, responsibilities, and access to resources are systematically shaped by institutions, norms, and policies. It argues that development processes are not neutral and often reinforce existing inequalities if gender is not explicitly considered (Parpart et al., 2000).

In relation to rural food systems, the GAD approach helps unpack how women's and men's roles in agriculture are influenced by cultural norms and institutional bias. For instance, while women contribute significantly to food production, they remain underrepresented in decision-

making structures and often lack ownership of critical assets like land (Mutopo, 2014; FAO, 2022). GAD thus supports an analysis that interrogates why women face structural disadvantages in responding to climate shocks and how these can be addressed through policy and practice.

3. Integrated Framework for this Study

This study adopts an integrated theoretical framework combining the Sustainable Livelihoods Framework and Gender and Development theory. While SLF provides a systems-level understanding of how rural households manage assets in response to droughts, GAD theory complements this by foregrounding the gendered dimensions of access, agency, and vulnerability.

Together, the models allow for a nuanced analysis of food system resilience that is both **structural and relational**: SLF explains *what* resources households rely on and *how* these are deployed under stress, while GAD interrogates *who* controls these resources and *why* access is often unequal. For example, SLF may identify that financial capital is key to resilience, but GAD reveals that women often lack access to credit due to discriminatory lending practices or lack of collateral (Chiweshe & Mutopo, 2020).

By integrating both models, the study positions gender as a central axis in understanding resilience—not simply as a demographic variable, but as a critical factor shaping exposure, coping strategies, and recovery capacity. This framework supports the research objectives by enabling a gender-sensitive assessment of how El Niño-induced droughts affect agricultural production and food availability in Zimbabwe's rural districts.

2.4 Summary of Literature Review

The literature reviewed in this study underscores the multifaceted impact of El Niño-induced droughts on rural food systems, particularly within the socio-economic and gender contexts of sub-Saharan Africa. El Niño events, characterized by prolonged dry spells and erratic rainfall, have historically devastated agricultural production in Zimbabwe, with smallholder farmers being the most affected due to their reliance on rain-fed agriculture (FAO, 2019; ZimVac, 2021). These climatic shocks have not only led to reduced crop yields and livestock losses but have also disrupted local food markets and increased food prices, exacerbating food insecurity in vulnerable rural communities.

A critical theme emerging from the literature is the gendered nature of drought impacts. Women, who provide most of the agricultural labor, often have less access to productive resources such as land, credit, training, and extension services (FAO, 2022). As a result, they face compounded vulnerabilities during climate crises. Studies show that female-headed households are more likely to experience severe food insecurity, with women bearing the brunt of caregiving, food provisioning, and emotional labor during drought periods (Mutopo, 2014; Chiweshe & Mutopo, 2020).

The literature also highlights gendered coping mechanisms, where women tend to rely on local, low-capital strategies such as food rationing, petty trading, and food-for-work programs, while men more frequently engage in labor migration and asset liquidation (Chanza & de Wit, 2016). These disparities are rooted in deeply entrenched gender norms that restrict women's agency and mobility, thereby limiting their adaptive capacity. Furthermore, institutional and community-based support systems often lack gender sensitivity, leaving many women excluded from drought relief programs and training opportunities.

Scholars emphasize the importance of gender-responsive policy interventions in building rural food system resilience. Recommendations include promoting equitable access to land and credit, strengthening gender-inclusive extension services, and institutionalizing social safety nets for female-headed households. Without addressing these structural inequalities, policy responses risk reinforcing existing gender disparities and undermining the effectiveness of climate resilience strategies (IPCC, 2022; WFP, 2016).

In summary, the literature reveals a strong consensus on the need to integrate gender analysis into climate adaptation planning. A gendered understanding of resilience provides a more accurate and equitable foundation for policy and practice aimed at safeguarding rural food security in the context of climate change.

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Chapter 3: Research Methodology

3.1 Introduction

This chapter outlines the methodology used to investigate the resilience of rural food systems to the 2023/24 El Niño-induced drought in Masvingo, Chivi, and Guruve districts of Zimbabwe, with a particular focus on gendered experiences and responses. The study employed a mixed-methods approach to provide a comprehensive understanding of how climatic shocks impact agricultural production and food availability, and how men and women adapt differently under such conditions. The research design, sampling techniques, data collection methods, and analytical strategies are presented in detail to ensure transparency and reproducibility. Emphasis is placed on the integration of both quantitative and qualitative data to capture the multifaceted and socially embedded nature of food system resilience. Additionally, the chapter explains the rationale for the chosen methodology, the geographical and demographic scope of the study, and the ethical considerations adhered to during the research process. By clearly outlining the methodological approach, this chapter establishes the foundation for the credibility, validity, and reliability of the findings presented in subsequent chapters. It also ensures that the study is aligned with its overarching objectives, particularly the assessment of gender-specific vulnerabilities, coping mechanisms, and institutional support structures in drought-affected rural communities.

3.2 Description of study sites

This study was conducted in Zimbabwe, a landlocked country in Southern Africa that is highly dependent on agriculture for food security and economic stability. The country experienced recurrent droughts, with the 2023/24 El Niño event exacerbating existing food system vulnerabilities. The research focused on selected rural districts, including Masvingo, Chivi, and Guruve, which were among the hardest-hit areas due to their reliance on rain-fed agriculture.

1. Masvingo District

- Location & Agro-Ecological Region: Situated in southeastern Zimbabwe, Masvingo lies predominantly in Natural Region IV and V, which are characterized by low and erratic rainfall (below 650 mm annually).

- Climate: Semi-arid with high temperatures and frequent droughts, making it one of the most climate-vulnerable districts in the country. It has been heavily affected by recurrent El Niño events.
- Economic Activities: The economy is primarily agro-based with a focus on semi-subsistence farming (mainly maize, groundnuts, and sorghum) and livestock rearing, especially goats and cattle. Informal trading, cross-border trading, and remittances are common secondary sources of income.
- Gendered Culture: In Masvingo, patriarchal norms dominate, with men typically controlling land and major household decisions. Women, however, contribute significantly to farm labor, especially weeding, harvesting, and marketing produce. Access to land and agricultural inputs remains skewed toward men, limiting women's adaptive capacity during climatic shocks.

2. Chivi District

- Location & Agro-Ecological Region: Also in southern Zimbabwe, Chivi falls mostly within Natural Region V, which is unsuitable for crop farming under rain-fed conditions and better suited to extensive livestock production.
- Climate: Hot and dry climate, with annual rainfall averaging 450–600 mm. The district is chronically drought-prone, with high food insecurity rates during El Niño years.
- Economic Activities: Predominantly livestock-based farming, especially goats and cattle. Smallholder farmers also grow drought-tolerant crops such as sorghum, millet, and cowpeas. There is limited irrigation, and the informal sector (e.g., artisanal mining, vending) supplements rural livelihoods.
- Gendered Culture: Traditional gender roles are entrenched, with women expected to manage household food and childcare. They often take up casual labor or petty trading when crops fail. Women have limited land rights, often farming on their husbands' or relatives' plots, which hinders investment in long-term resilience strategies.

3. Guruve District

- Location & Agro-Ecological Region: Located in northern Zimbabwe, Guruve lies mostly within Natural Region III, which receives moderate rainfall (between 650–800 mm annually), making it more agriculturally productive than Masvingo or Chivi.

- Climate: Although relatively better watered, Guruve also experiences seasonal rainfall variability and is increasingly susceptible to climate extremes linked to El Niño events.
- Economic Activities: Agriculture is more diversified here, with production of maize, tobacco, groundnuts, and horticultural crops. Livestock rearing is common, and the district benefits from small-scale irrigation schemes.
- Gendered Culture: Though women are heavily involved in agriculture, especially in tobacco processing and food production, they often remain excluded from decision-making. Cultural expectations assign women domestic roles, while men control marketing and income from cash crops. Women's access to extension services is limited compared to their male counterparts.

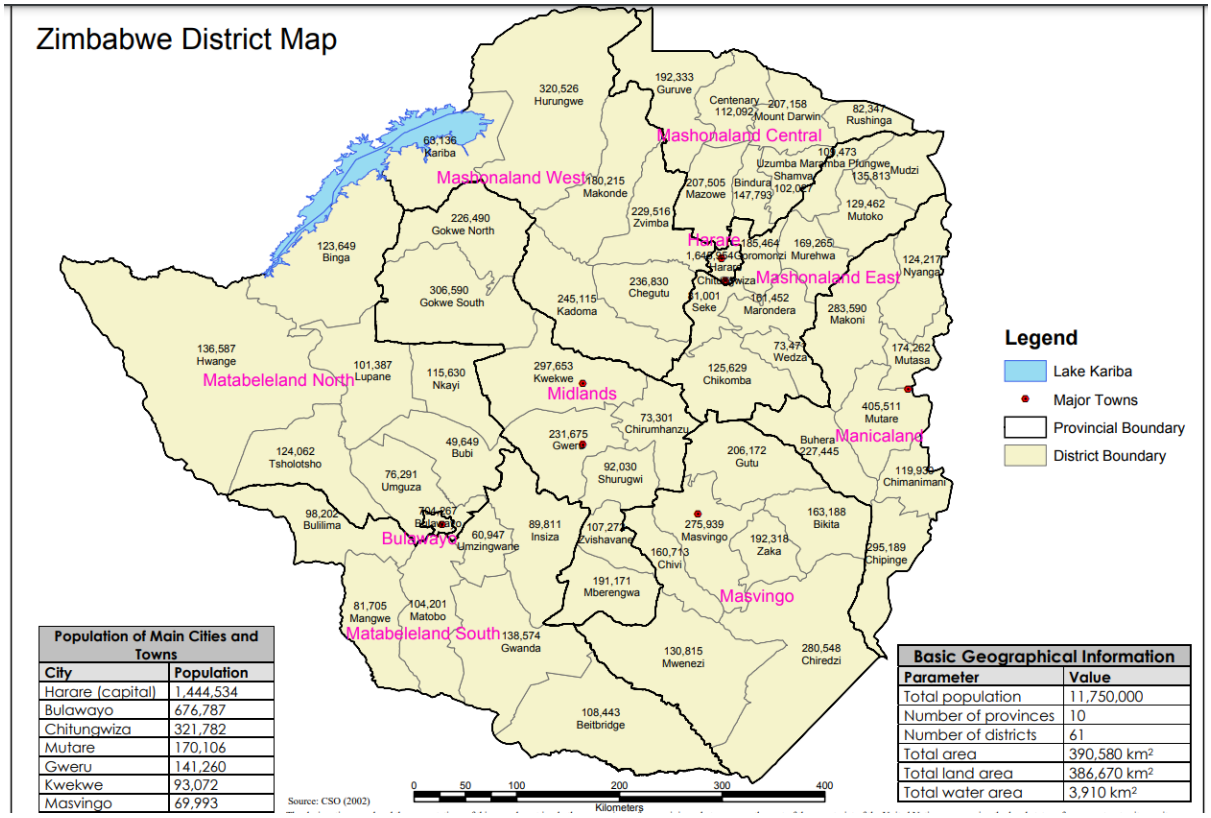

Figure 2: Zimbabwe District Map

3.3 Research Design

The study employed cross sectional study. The researcher used mixed-methods approach, integrating both quantitative and qualitative data collection techniques to capture the gendered impacts of El Niño-induced droughts on food security and agricultural resilience. The research

design ensured triangulation, allowing for a comprehensive understanding of gendered vulnerabilities and coping mechanisms.

3.4 Sampling Procedure

The study employed a multi-stage sampling approach combining proportionate stratified random sampling for household surveys and purposive sampling for qualitative focus group discussions (FGDs) and key informant interviews (KIIs). This mixed-method strategy was selected to ensure both quantitative representativeness and in-depth, gender-sensitive insights aligned with the research objectives.

3.4.1Target Population

The target population comprised rural households in Masvingo, Chivi, and Guruve districts—areas identified as climate-vulnerable and significantly affected by the 2023/24 El Niño-induced drought. These communities rely heavily on rain-fed agriculture and exhibit pronounced gender disparities in access to resources and decision-making power.

3.4.2 Stratified Random Sampling for Household Surveys

To ensure gender representation, the household survey employed proportionate stratified random sampling based on household headship (male-headed and female-headed households). Stratification ratios were informed by the latest demographic data from ZimStat (2021) and were validated with local community records. A total of 198 households were selected across the three districts. Households within each stratum were randomly chosen using a random number generator to reduce selection bias and enhance statistical reliability. The sample was proportionally allocated to each district and stratum to reflect actual population characteristics. This approach ensured an accurate gender-disaggregated analysis of drought impact, food security, and coping mechanisms.

Supplementary Sampling for Marginalized Groups

To address the risk of underrepresentation of vulnerable populations (e.g., widowed women, informal settlers, and households headed by persons with disabilities), a snowball sampling technique was applied. Local informants assisted in identifying households not captured in official lists but critical to a nuanced understanding of rural vulnerability and resilience.

Purposive Sampling for Focus Group Discussions (FGDs)

Three (3) focus group discussions were conducted—one in each district. Participants were selected purposively based on their involvement in farming, household food management, and

decision-making roles. Separate sessions were arranged for men and women when appropriate to allow free expression and reduce social pressure. The FGDs aimed to: Uncover community-level gender dynamics, Explore perceptions and experiences of the El Niño drought and Identify household and community-level coping strategies. Each group comprised 8–12 participants, with attention to age, marital status, and household roles.

Key Informant Interviews (KIIs)

Seven (7) key informant interviews were conducted with knowledgeable individuals including: Agricultural extension officers, Local leaders (village heads or councillors), NGO field officers, Gender officers or development practitioners and Local health or nutrition experts. KIIs were instrumental in understanding institutional responses to drought, policy implementation gaps, and gender-sensitive support programs available in each district.

Recruitment of Participants: Recruitment was facilitated through collaboration with community leaders, agricultural extension officers, and local development partners. This ensured culture

3.4.3 Sample Size Determination:

A sample size of approximately 200 households was targeted, with equal representation across the strata. The sample size is calculated based on the estimated population of rural households in the selected districts, aiming for a 95% confidence level and a margin of error of 5%. Samples should not be too large in which case, it will not conserve resources, which are usually limited (Araoye 2003, pp. 115, 116). The formula for the sample size determination: When the population is less than 10,000, sample size was calculated using

$$n = z^2 \frac{(1-p)\,p}{d^2}$$

Where:

z = the standard normal deviate set at 1.96, which corresponds with the 95% confidence interval.

p = the proportion in the target population estimated at 15% based on a similar studies (Karuru et al., 2020).). Therefore p = 0.15.

Therefore, $n = (1.96)^2 * \frac{(0.85)\,(0.15)}{(0.05)^2} = 196$

Using 99% response rate, samples size added up to 198 participants. Making it to 66 participants per district.

3.5 Data Collection Procedure

The study utilized a combination of structured and semi-structured tools:

1. Surveys: Structured questionnaires were administered to capture quantitative data on household characteristics, agricultural activities, food security status, and adaptive strategies.
2. Focus Group Discussions (FGDs): Separate FGDs were conducted for men and women to explore gender-specific experiences and coping mechanisms.
3. Key Informant Interviews: Interviews were conducted with local leaders, agricultural extension officers, and policymakers to gain insights into institutional support and policy interventions.
4. Observational Checklist: Field observations were used to assess environmental conditions, water availability, and farming practices in the study areas.

3.6 Data Analysis Procedure

Data analysis involved both statistical and thematic techniques:

Objective 1: To assess the effect of the El Niño-induced drought on agricultural production and food availability

- Descriptive statistics (means, frequencies, and percentages) were used to quantify the perceived impact of the drought on crop yields and food availability across households.
- Independent samples t-tests were conducted to compare perceptions of production decline between male and female respondents.
- Levene's Test for Equality of Variances was applied to assess the homogeneity of variance between gender groups.
- Qualitative data from Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were analyzed thematically to complement quantitative insights on agricultural disruption and food supply challenges.

Objective 2: To examine the gendered effects of the drought on rural food systems, focusing on challenges and coping mechanisms

- A logistic regression analysis was conducted to identify key predictors of household vulnerability, with gender, income source, and training status entered as independent variables.
- Descriptive analysis was used to examine gender roles in agricultural labor, decision-making, and access to productive resources.
- Thematic analysis of KIIs and FGDs was conducted to explore gender-specific challenges, role shifts, caregiving burdens, and social constraints experienced during the drought.

Objective 3: To identify and analyze coping mechanisms used by rural households to maintain food security during the drought

- Survey data on household coping strategies were coded and summarized using frequency and cross-tabulation tables, disaggregated by gender.
- A categorical analysis of coping strategy types (e.g., migration, food rationing, informal trade) was performed to understand behavioural patterns.
- Thematic analysis of qualitative data identified common community responses, informal support systems, and the influence of socio-cultural norms on coping behaviour.

Objective 4: To recommend gender-sensitive interventions and policies for strengthening rural food systems

- Integrated analysis of quantitative results (e.g., significant predictors from logistic regression) and qualitative themes (e.g., institutional barriers, exclusion from aid) was conducted to develop targeted policy recommendations.
- The findings were cross-referenced with existing policy frameworks and international development goals (e.g., SDGs 1, 2, and 5).

- Gaps in support systems and access were coded from KIIs and FGDs to identify priority areas for intervention and reform.

3.7 Ethical Considerations

The study adhered to ethical research guidelines to ensure participant protection:

- Informed Consent: Participants were fully informed about the study's purpose, risks, and confidentiality measures before giving consent.
- Confidentiality: Responses were anonymized, and data were securely stored to protect participants' privacy.
- Cultural Sensitivity: Separate FGDs were conducted for men and women to ensure comfortable participation and avoid power imbalances.

3.8 Summary

Chapter 3 presented the methodological approach employed to investigate the gendered resilience of rural food systems to the 2023/24 El Niño-induced drought in Masvingo, Chivi, and Guruve districts of Zimbabwe. The study adopted a mixed-methods research design, combining both quantitative and qualitative approaches to comprehensively capture the complex interactions between climate shocks, agricultural production, food availability, and gender dynamics. The study area was carefully selected based on its vulnerability to drought and dependence on rain-fed agriculture. A multi-stage sampling technique was used, with stratified random sampling applied to select 198 households for the survey, ensuring representation of both male- and female-headed households. Additionally, purposive sampling was used for three Focus Group Discussions (FGDs) and seven Key Informant Interviews (KIIs) involving agricultural officers, community leaders, and NGO representatives. Data were collected using structured questionnaires, semi-structured interview guides, and observation checklists. Quantitative data were analyzed using SPSS and Stata, with descriptive and inferential statistics (e.g., t-tests, chi-square tests, logistic regression) applied to examine gendered patterns in food security and drought resilience. Qualitative data from FGDs and KIIs were analyzed thematically using NVivo, allowing for deeper insights into social norms, coping strategies, and institutional support structures. The chapter also addressed ethical considerations, including informed consent, confidentiality, and cultural sensitivity. Limitations such as accessibility challenges, time constraints, and potential social desirability

bias were acknowledged to ensure transparency and contextual integrity. In summary, Chapter 3 laid the foundation for the study's credibility by outlining a robust methodological framework capable of capturing the gender-specific impacts and adaptive responses to climate-induced food system shocks in rural Zimbabwe.

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Chapter 4: Results

Manuscript Title: Gendered Impacts of the 2023/24 El Niño Drought on Agricultural Production and Food Availability in Rural Zimbabwe"

Abstract

This study explores the gendered resilience of rural food systems in response to the 2023/24 El Niño-induced drought in Masvingo, Chivi, and Guruve districts of Zimbabwe. Using a mixed-methods approach, the study collected data from 198 household surveys, three focus group discussions (FGDs), and seven key informant interviews (KIIs). The analysis focused on gender-specific roles in agriculture, differential access to resources, and variations in coping mechanisms during drought events. Findings reveal that although both men and women reported significant reductions in agricultural productivity, women experienced greater variability in impacts due to systemic inequalities in land access, credit, and decision-making. Statistical tests showed no significant difference in average production decline between men and women; however, logistic regression confirmed that gender, income source, and training significantly influenced household vulnerability. Women tended to adopt more localized, survival-based coping mechanisms, while men engaged in labour migration and asset liquidation. These findings underscore the need for gender-responsive policies and capacity-building initiatives to strengthen food system resilience in climate-vulnerable regions.

Keywords

El Niño, Gender resilience, Rural food systems, Climate adaptation and Zimbabwe agriculture

4.1 Introduction

The 2023/24 El Niño-induced drought presented significant challenges to Zimbabwe's agricultural sector, particularly in drought-prone rural districts such as Masvingo, Chivi, and Guruve. These areas depend heavily on rain-fed agriculture, making them highly susceptible to climatic variability. While previous research has examined the impacts of drought on agricultural production, fewer studies have investigated the gendered dimensions of resilience in rural food systems. This chapter presents the findings of a field-based study assessing the differential effects of the drought on men and women, with attention to access to resources, coping mechanisms, and institutional support structures.

4.2 Materials and Methods

4.2.1 Description of Study Area

The study was conducted in three districts of Zimbabwe: Masvingo, Chivi, and Guruve. Masvingo and Chivi, located in Masvingo Province, fall within Natural Regions IV and V and are characterized by low rainfall and frequent droughts. Guruve, situated in Mashonaland Central Province, lies in Natural Region III and receives relatively more rainfall, although it is increasingly affected by climatic variability. All districts primarily depend on subsistence farming, with notable gender-based disparities in land ownership, labour, and decision-making.

4.2.2 Research Design

As outlined in Chapter 3, the study employed a mixed-methods cross-sectional design, integrating both quantitative (household surveys) and qualitative (FGDs and KIIs) data collection to ensure a comprehensive analysis of gendered drought impacts.

4.2.3 Sampling Procedure

Refer to Section 3.2 of Chapter 3. The study used a multi-stage sampling approach, combining stratified random sampling for household surveys and purposive sampling for qualitative interviews.

4.2.4 Data Collection Procedure

Data were collected using structured questionnaires for household heads, FGD guides for gender-disaggregated discussions, and KII protocols targeting local leaders and agricultural officers. The instruments were pre-tested to ensure clarity and contextual relevance.

4.2.5 Data Analysis Procedure

Descriptive statistics (mean, SD, frequency) and inferential tests (t-tests, logistic regression) were used to analyze quantitative data using SPSS and Stata. Thematic analysis was employed for qualitative data using NVivo. Analysis procedures are detailed in Chapter 3, Section 3.5.

4.2.6 Challenges Encountered During Data Collection

Several challenges were encountered during data collection, including:

- **Poor road networks** in remote areas, limiting access to some villages.
- **Cultural sensitivities**, especially regarding women's participation in group discussions.
- **Recall bias**, with some respondents unable to accurately remember production losses.

- **Weather disruptions**, including delayed rains, which complicated timing of visits in certain regions.

4.3 Results

4.3.1 Demographic Profile of Participants

A total of 7 Key Informant Interviews (KIIs) and 3 Focus Group Discussions (FGDs) were conducted. The KIIs targeted individuals with direct involvement in agriculture, food security, or rural development in drought-prone areas. Participants held various community and organizational roles, including Agriculture Advisor, Secretary General of the Zimbabwe Young Farmers for Sustainable Development, Community Leader, Agricultural Community Leader, Women Leader, Environmental Social Leader and Beekeeper. These individuals had between 2 and 27 years of experience, reflecting a broad and deep understanding of rural dynamics. The FGDs engaged rural community members—both men and women—representing households directly affected by El Niño-induced drought. This ensured a balanced and grounded perspective rooted in lived experiences.

This table 4.1 provides a detailed demographic profile of the 198 respondents. The sample includes more females (104) than males (94), which aligns with the study's aim to explore gendered experiences. Educational attainment is varied: 66 respondents had only primary education, 97 had secondary, and 35 had tertiary education, suggesting a relatively literate population with potential for understanding agricultural interventions. A significant finding is that 147 respondents identified themselves as heads of household—indicating a high number of self-reliant individuals, possibly reflecting the burden on women in female-headed households. Household size was nearly evenly split between those with four or fewer members (95) and those with more than four (104), a factor that may influence food security needs. Farming emerged as the dominant income source (111), reflecting the rural and agriculture-dependent nature of the study sites. Other sources like vending, remittances, and pensions indicate diversification but may also reflect economic precarity. The age data reveal that both male and female respondents are middle-aged on average (male mean = 43.59, female mean = 44.99), consistent with a population actively engaged in agricultural and caregiving responsibilities. Marital status shows a majority were married (104), but the presence of widowed (56) and divorced (17) individuals—mostly likely women—adds to the understanding of social vulnerability in the face of climate shocks.

Table 4.1 Demographics

Variable	Category	Frequency
Education Level	Primary	66
Education Level	Secondary	97
Education Level	Tertiary	35
Gender	Female	104
Gender	Male	94
Head of Household	Husband	24
Head of Household	Me	147
Head of Household	My Father	11
Head of Household	My Son	9
Household Size	less or equal to 4	95
Household Size	greater than 4	104
Main Source of Income	Buying and selling	17
Main Source of Income	Cash for work	4
Main Source of Income	Electrician and farming	4
Main Source of Income	Employed	18
Main Source of Income	Farming	111
Main Source of Income	Gardening	4
Main Source of Income	remittances	7
Main Source of Income	Pension	13
Main Source of Income	Poultry	7
Main Source of Income	Vending	12
Marital Status	Divorced	17
Marital Status	Married	104
Marital Status	Single	21
Marital Status	Widowed	56
Male age	Mean	43.59 (sd=19.107)
Female age	Mean	44.99(sd=12.724)

4.3.2 Gendered Roles in Agriculture and Access to Resources

The study's first objective was to explore gendered roles in agriculture and how these influence access to land, credit, and farming resources. Both Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) revealed recurring themes that speak to deep-seated gender disparities in rural agricultural systems.

Women's Access Barriers

A dominant theme across responses was the systematic exclusion of women from critical agricultural resources. Participants consistently pointed to traditional norms that define men as primary landholders and gatekeepers of farming inputs.

“Limited access to land, credit, technology, labour and time due to societal roles placed on women.” *(KII – Agricultural Advisor)*

“Man are considered the breadwinners hence most resources are directed to them.” *(FGD participant)*

Despite their essential roles in food production, women are frequently marginalized when it comes to asset ownership and decision-making, hindering their ability to innovate or expand their farming activities.

Gendered Division of Labor

FGDs illuminated a clear division of labour within households and communities. Women typically engage in planting, weeding, and harvesting, while men focus on land preparation and livestock management.

“Women do most of the work. Men handle land preparation, but women dominate planting and weeding.” *(FGD participant)*

“Women are mostly active in field work, but men own the tools and make the decisions.” *(FGD)*

This labour burden does not always translate to empowerment or recognition, as women are often relegated to supportive roles rather than leadership in agricultural planning.

Limited Autonomy in Farming Decisions

Women’s involvement in farming decision-making is often mediated through their relationships—typically with husbands or male elders. While some participants acknowledged women’s growing participation in household decisions, this remains limited and context-dependent.

“Yes, women make more family-oriented and developmental decisions, but usually after consulting their husbands.” *(FGD)*

“Men dominate decisions on selling and buying inputs; women decide on cooking and family meals.” *(FGD participant)*

4.3.3 Gendered Impacts of El Niño-Induced Drought

This table 4.2 compares perceptions of production decline between male and female respondents during the El Niño-induced drought. The mean proportion of perceived production decrease was slightly higher for males (62.76) compared to females (61.71). However, the standard deviation was significantly larger for females (21.19 vs. 13.53), suggesting that women's experiences were more varied—possibly reflecting diverse coping capacities or access to resources. The minimal mean difference implies that both genders experienced notable impacts on agricultural production, reinforcing the widespread effect of the drought. However, the variability in female responses also hints at unequal access to mitigating resources or differing vulnerabilities across communities.

Table 4.2: Mean comparisons

Group Statistics					
	_	**N**	**Mean**	**Std. Deviation**	**Std.Error Mean**
Production decreased proportion	**male**	**87**	**62.76**	**13.528**	**1.450**
	female	**70**	**61.71**	**21.194**	**2.533**

Production Decrease by Gender

The independent samples t-test indicates no statistically significant difference in the perception of production decrease between men and women ($p = 0.708$ under equal variances assumed). The Levene's Test ($p = 0.002$) suggests unequal variance in the data, further confirming the varied experiences among women. Despite the differences in standard deviations, the near-zero mean difference (1.044) confirms that both genders were similarly affected in aggregate terms. However, the larger variance among female respondents remains critical to understanding the differentiated impact at the household level. This reinforces the need for gender-sensitive assessments and interventions, rather than gender-neutral ones, as aggregate equality may mask intra-group inequalities.

Table 4.3 Independent Samples Test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Production decreased	Equal variances assumed	9.750	.002	.375	155	.708	1.044	2.788	-4.463	6.552
	Equal variances not assumed			.358	111.994	.721	1.044	2.919	-4.739	6.828

Logistic Regression Goodness of Fit

The logistic regression model presented in this table demonstrates a strong fit with a -2 Log Likelihood of 99.134, and Nagelkerke R Square of 0.634. This suggests that the model explains approximately 63.4% of the variance in the dependent variable—presumably related to gendered drought response or food insecurity outcomes. This relatively high explanatory power implies that the included predictors (gender, income source, training) are strongly associated with the outcome variable. This is particularly important when modelling

resilience or vulnerability, as it provides evidence-based justification for targeted gender and livelihood-based interventions.

Table 4.4 Model Summary

Model Summary			
Step	**-2 Log likelihood**	**Cox & Snell R Square**	**Nagelkerke R Square**
1	**99.134[a]**	**.405**	**.634**

Predictors of Drought Resilience or Impact

This table identifies significant predictors of the outcome variable (likely resilience or coping success). Gender (p = 0.000; Exp(B) = 4.102) is a strong predictor, indicating that being female significantly increases the likelihood of experiencing the outcome—potentially vulnerability or reduced resilience. The odds ratio suggests females are over four times more likely to be affected. Income source (Exp(B) = 0.615) and training (Exp(B) = 0.193) are also significant. Notably, access to training has the strongest protective effect, with an odds ratio below 1, implying that respondents with training are significantly less likely to experience the negative outcome. These findings underscore the transformative potential of capacity-building interventions and the critical role of economic and gender structures in shaping resilience to drought.

Table 4.5 Logistic regression

Variables included		**Sig.**	**Exp(B)**	**95% C.I.for EXP(B)**	
				Lower	**Upper**
Step 1[a]	**gender (1)**	**.000**	**4.102**	**2.906**	**8.382**
	INCOME_SOURCE	**.000**	**.615**	**.506**	**.746**
	TRAIING	**.000**	**.193**	**.106**	**.352**
	Constant	**.000**	**7.048**		

The second objective of the study was to assess how El Niño-induced drought differently affects men and women in rural communities. The qualitative responses from both KIIs and

FGDs provide clear evidence of gendered vulnerabilities and shifting household dynamics in times of climate stress.

Increased Burden on Women

Participants reported that women experience heightened pressure during drought periods, particularly as caregivers and food providers. As food and water become scarce, women are often the ones who must find alternatives—whether by reducing meals, fetching water from distant sources, or working informal jobs.

"Increased caregivers' burden, food and water insecurity, walking long distances to fetch water and food." *(KII – Agricultural Advisor)*

"Women tend to go and look for food more than men." *(FGD participant)*

Women's emotional and physical workloads multiply during crises, and yet they often have the least structural support or recognition for their efforts.

Male Outmigration and Female Responsibility

A recurring pattern was that men often migrate to towns or neighbouring areas in search of employment during droughts. This shifts the burden of both agricultural production and household maintenance onto women.

"Men migrate for work and women are forced to fend for families alone." *(KII – Community Leader)*

"More women are taking up cash-for-work in farming to support families." *(FGD)*

This migration trend, while a survival strategy, leaves women vulnerable and overburdened, particularly those with small children or elderly dependents.

Impact on Children and the Elderly

The most vulnerable members of households during food shortages were children, the elderly, and school-going youth. Respondents noted that these groups are least able to cope with hunger and most at risk of malnutrition or illness.

"Children, the elderly and young women are the most affected." *(FGD)*

"They cannot fend for themselves." *(FGD – on children)*

The intersection of age, dependency, and gender produces complex layers of vulnerability, especially in female-headed households.

Shifts in Gender Roles

Interestingly, the drought has also triggered some renegotiation of traditional gender roles. With men absent or disengaged, women are stepping into leadership, income generation, and decision-making spaces.

"Women become the breadwinners who sustain the household in the absence of men." *(KII – Agricultural Leader)*

"Yes, more women now are doing what men used to do, including planning and buying food." *(FGD participant)*

Although these changes reflect adaptability, they are often **born out of necessity**, not empowerment, and may not lead to long-term structural equality unless supported.

4.4 Discussion

4.4.1 Gendered Roles in Agriculture and Access to Resources

The results from KIIs and FGDs underscore persistent gender disparities in agricultural roles and access to critical resources such as land, credit, training, and agricultural inputs. Women, despite being heavily involved in labour-intensive activities like planting, weeding, and harvesting, were found to be largely excluded from decision-making and ownership of productive assets. This aligns with previous studies (Chiweshe & Mutopo, 2020; Mutopo, 2014), which argue that patriarchal land tenure systems in Zimbabwe reinforce male dominance in resource control.

Women's limited autonomy was evident in both access and influence: while they participated in farming tasks, their ability to make decisions about what to grow or how to manage resources was mediated through male household heads. This supports Kabeer's (1999) empowerment framework, which highlights how structural constraints restrict women's agency even in domains where they are active contributors.

Moreover, this study found that women's access to agricultural resources was often hindered by entrenched social norms that label men as primary providers. Similar observations were

made in FAO (2022), which emphasized the need for gender-transformative approaches to agriculture. This continued marginalization not only disempowers women but also limits the efficiency of agricultural production and resilience of food systems in the face of climate shocks.

4.4.2 Gendered Impacts of El Niño-Induced Drought

The study found that both male and female farmers experienced reduced agricultural productivity due to the drought. However, the statistical analysis revealed a greater variability in female responses—suggesting differentiated capacities to withstand shocks within the same gender category. This aligns with WFP (2023) findings that female-headed households in Zimbabwe are more prone to food insecurity and malnutrition, particularly during climate-induced crises.

Crucially, logistic regression analysis showed that gender was a significant predictor of vulnerability, with women being over four times more likely to experience negative drought impacts. This reinforces earlier work by Chanza & de Wit (2016) and IPCC (2022), which highlight that gender is a central determinant of climate vulnerability in Southern Africa.

The discussion also surfaced critical qualitative insights. Women bore the brunt of caregiving responsibilities as men migrated in search of income—shifting the agricultural and household management burden to them. This echoes WFP (2016), which described how climatic stressors exacerbate existing gender inequalities by increasing unpaid labour for women. The burden on women was not only physical but also emotional, as they had to cope with the responsibility of feeding their households under extreme conditions.

Interestingly, the findings suggest that the drought catalyzed temporary shifts in gender roles. Women took up responsibilities traditionally reserved for men, including decision-making and income generation. While this demonstrates resilience and adaptability, it also reveals a crisis-driven form of empowerment that may not translate into long-term gender equity unless supported by structural reforms, as argued by Scoones (1998) and AGRA (2019).

The results underscore how entrenched gender norms amplify vulnerability during climatic shocks. While both men and women faced declines in agricultural output, the burden on women was greater due to their limited autonomy and access to resilience-building resources. The lack

of statistically significant differences in production losses obscures intra-gender disparities, as shown by the high variance in women's responses. Women's coping strategies were often reactive—food-for-work, rationing, and informal trade—while men employed migration or sold livestock.

Logistic regression confirmed that vulnerability is structurally embedded, with training and income diversification offering clear protective effects. These findings reinforce literature by Chiweshe and Mutopo (2020) and FAO (2022), which highlight the need for gender-transformative adaptation strategies that address access, equity, and empowerment.

4.5 Recommendations

Based on the results and discussion, the following recommendations are proposed:

1. **Promote gender-sensitive agricultural extension services**, ensuring that women have equal access to training and inputs.
2. **Strengthen social protection programs**, such as food aid and cash transfers targeted at female-headed households.
3. **Encourage women's land ownership** through legal reforms and community advocacy.
4. **Support income diversification** initiatives that equip women with skills and capital for non-agricultural livelihoods.
5. **Incorporate gender-disaggregated data** into early warning systems and drought relief planning.

4.6 Conclusion

This chapter provided a detailed analysis of how the 2023/24 El Niño drought affected rural food systems in three Zimbabwean districts, with a focus on gendered experiences. While both men and women experienced production losses, women faced deeper, more variable impacts due to systemic inequality. The study highlights the importance of addressing structural gender barriers to improve resilience and food security outcomes under climate stress.

4.7 References

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Chapter 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the findings of the study on the resilience of rural food systems to the 2023/24 El Niño-induced drought in Zimbabwe's Masvingo, Chivi, and Guruve districts, with a gendered lens. By analyzing both quantitative and qualitative data, the discussion interprets how men and women experienced and responded to the drought, framed around the study's three core objectives. The findings are critically examined in relation to existing literature, highlighting both consistencies and research gaps.

5.2 Research summary

This study critically assessed the resilience of rural food systems to the 2023/24 El Niño-induced drought in three drought-prone districts of Zimbabwe—Masvingo, Chivi, and Guruve—with a specific focus on gendered experiences and responses. The research aimed to explore how men and women differently experience, cope with, and recover from climate-induced agricultural and food security shocks, recognizing the often-overlooked structural inequalities that shape these dynamics.

A mixed-methods research design was employed, combining quantitative data from 198 household surveys with qualitative insights drawn from three focus group discussions (FGDs) and seven key informant interviews (KIIs). The study was grounded in an integrated theoretical framework combining the Sustainable Livelihoods Framework (SLF) and Gender and Development (GAD) theory, which together provided a lens for understanding how gender, resource access, and institutional structures influence food system resilience.

The findings reveal that while both men and women experienced agricultural losses due to drought, women faced greater vulnerability due to limited access to land, credit, agricultural training, and decision-making power. Statistical analyses (including t-tests and logistic regression) confirmed that gender, source of income, and access to training significantly predicted household vulnerability levels. Coping mechanisms were highly gendered: women relied on localized and low-capital strategies such as food-for-work, rationing, and small-scale trade, while men were more likely to migrate, sell livestock, or take on commercial farm work.

Qualitative data further revealed gaps in institutional support. Women often faced barriers to participating in relief programs due to mobility constraints, caregiving responsibilities, and exclusion from information channels. Community-based support systems were found to be

inconsistent and often politically biased, with female-headed households particularly underserved.

The study concludes that addressing rural food insecurity and enhancing climate resilience requires gender-transformative approaches. These include expanding women's access to agricultural resources, designing inclusive training and extension services, and reforming policy structures that perpetuate inequality. Without deliberate attention to gender disparities, efforts to build resilient rural food systems will remain incomplete and ineffective.

Ultimately, this research contributes valuable evidence to the discourse on climate resilience, food security, and gender equity in Southern Africa. It provides practical insights for policymakers, development practitioners, and local leaders aiming to strengthen rural livelihoods in the face of increasing climatic uncertainty.

5.3 Conclusion

This study set out to assess the resilience of rural food systems to the 2023/24 El Niño-induced drought in Masvingo, Chivi, and Guruve districts, focusing on the gendered dimensions of impact and response. Using a mixed-methods approach involving household surveys, key informant interviews (KIIs), and focus group discussions (FGDs), the study produced three core conclusions aligned with the research objectives.

Firstly, the study found persistent gender disparities in agricultural roles and access to resources. While women play critical roles in food production, they remain excluded from land ownership, credit access, input procurement, and decision-making processes. Traditional gender norms continue to marginalize women in rural agricultural systems, curtailing their productivity and resilience.

Secondly, the El Niño drought disproportionately impacted women, who were more likely to experience reduced production, food insecurity, and caregiving burdens. Quantitative analysis confirmed that gender, income source, and access to training were statistically significant predictors of vulnerability. While men often migrated in search of work, women remained to care for households, shoulder agricultural responsibilities, and manage limited resources—often with minimal support.

Thirdly, coping strategies were highly gendered and indicative of structural inequalities. Women adopted localized, low-capital strategies such as food rationing, small-scale trading, and community-based support, while men pursued migration and asset-based responses.

Although some women assumed new leadership roles in the absence of men, this shift was driven more by necessity than genuine empowerment.

Overall, the study underscores that resilience in rural food systems is deeply gendered. Enhancing this resilience requires dismantling the systemic barriers that limit women's agency, access to resources, and participation in decision-making. Without targeted interventions, El Niño-type shocks will continue to widen gender disparities and weaken household coping capacities.

5.4 Policy Implications and Recommendations

The findings of this study on the gendered resilience of rural food systems to the 2023/24 El Niño-induced drought in Zimbabwe have critical implications for national policy and development practice. Addressing the structural and institutional drivers of vulnerability—particularly those rooted in gender inequality—is essential for strengthening food system resilience and achieving sustainable development goals.

1. Promote Gender-Transformative Agricultural Policies

Current agricultural and land tenure systems disproportionately disadvantage women, limiting their ability to respond to climate-induced shocks. Policy makers should prioritize the revision of land ownership laws to ensure secure tenure for women, alongside inclusive access to credit, inputs, and extension services. Agricultural programs must be designed with gender-specific needs in mind—accounting for women's caregiving responsibilities, time constraints, and socio-cultural barriers. This includes the introduction of targeted subsidies for female-headed households and the integration of gender-disaggregated indicators in agricultural planning and monitoring.

2. Expand Access to Climate-Resilient Training and Information

This study confirms that access to agricultural and climate adaptation training is a key factor in reducing vulnerability. Policies should support the decentralization and localization of training programs, ensuring that women in remote areas can participate. Content should include drought-resistant crops, water conservation practices, and diversified livelihood strategies.

Practical steps include scheduling training during hours that accommodate women's roles, delivering training in local languages, and using community-based facilitators.

3. Support Women's Economic Empowerment and Livelihood Diversification

Women's resilience is directly linked to their economic independence. Development practitioners should promote context-specific livelihood diversification initiatives, including support for women-led cooperatives, savings groups, and micro-enterprises. Programmes should offer access to start-up capital, mentorship, and market linkages, enabling women to pursue both agricultural and non-agricultural income-generating activities. Strengthening these pathways can reduce women's reliance on precarious survival strategies and improve household food security.

4. Strengthen Community-Based Safety Nets and Early Warning Systems

Effective drought response requires functional and inclusive support systems. Policymakers and NGOs should work with traditional leaders and local institutions to institutionalize safety nets that are transparent, apolitical, and gender sensitive. Community-based targeting approaches can enhance the reach of support to the most vulnerable, particularly female-headed households. Additionally, gender-sensitive early warning systems should be developed to provide timely and actionable information, allowing communities to prepare and respond effectively to climate shocks.

5. Address Gender Norms Through Awareness and Social Dialogue

Technical interventions must be complemented by social transformation to dismantle entrenched gender inequalities. Programs should facilitate community dialogues, school-based curricula, and media campaigns that promote equitable sharing of labor, resource access, and decision-making within households and communities. Engaging men and boys as allies in promoting gender equity can shift harmful norms and foster shared responsibility in resilience-building efforts.

5.5 Areas for Further Research on Gendered Climate Resilience

There is a need for sustained investment in evidence-based policy making. Future research should explore:

- Long-term and intergenerational impacts of climate shocks on women and girls.

- The intersectionality of gender with other forms of vulnerability (e.g., age, disability, poverty).
- The role of indigenous knowledge and local innovation in resilience building. Longitudinal and mixed-methods studies will be especially valuable in tracking evolving vulnerabilities and adaptive capacities over time.

5.6 References

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5.7 Appendix A: Data Collection Tools

A1: Key Informant Interview (KII) Guide

Introduction:

Thank you for taking the time to participate in this interview. This study seeks to understand the gendered impacts of El Niño-induced drought on rural food systems, focusing on differential vulnerabilities, coping strategies, and resource access. Your insights will contribute to developing policies and interventions for enhancing food security. All responses will be kept confidential.

Section 1: Background Information

1. What is your name (optional)?
2. What is your role and responsibilities within your organization/community?
3. How long have you been involved in agriculture, food security, or rural development?

Section 2: Gendered Impact of Drought on Rural Food Systems

4. How has El Niño-induced drought affected men and women differently in rural communities?
5. What are the main challenges faced by women compared to men in accessing agricultural resources such as land, credit, and technology?
6. How do household responsibilities shift for men and women during drought periods?
7. Who is more vulnerable to food insecurity during drought, and why?

Section 3: Coping Mechanisms and Community Responses

8. What are the common coping mechanisms used by rural households during droughts?
9. How do men and women's coping strategies differ?
10. What role do social networks and community-based support systems play in mitigating food insecurity?
11. Are there any gender-specific initiatives in place to help women cope with drought impacts?

Section 4: Policy and Institutional Support

12. What policies or programs currently exist to support rural communities affected by drought?
13. How effective have these policies been in addressing gender disparities in food security?
14. What challenges do institutions face in implementing gender-sensitive climate adaptation strategies?
15. What recommendations would you make to improve gender-responsive policies for drought resilience?

Conclusion:

16. Is there anything else you would like to add about gender, drought, and food security?
17. Thank you for your valuable insights. Your contributions will help inform more effective and inclusive food security strategies.

A2: Survey Questionnaire

Introduction:

Thank you for agreeing to participate in this survey. The purpose of this study is to assess the gendered impacts of El Niño-induced drought on rural food systems, particularly focusing on vulnerabilities, coping strategies, and access to adaptation resources. The information you provide will remain confidential and will only be used for research purposes. Your participation is voluntary, and you may withdraw at any time.

This survey consists of four sections:

- **Section A:** Demographic Information
- **Section B:** Agricultural and Food Security
- **Section C:** Gendered Impact of Drought
- **Section D:** Access to Resources and Adaptation Strategies

It should take approximately 15-20 minutes to complete.

Section A: Demographic Information

1. What is your age? _____
2. What is your gender?
    - ○
3. What is your marital status?
    - ○
4. How many people live in your household? _____
5. Who is the head of your household?
    - ○
6. What is the highest level of education you have completed?
    - ○
7. What is your main source of income?

- ○

Section B: Agricultural and Food Security

8. What type of farming do you practice? _____
9. What are your main crops/livestock? _____
10. Has your farm production changed due to drought? _____
11. If decreased, what percentage loss have you experienced? _____%
12. What challenges do you face in accessing agricultural inputs (e.g., seeds, fertilizers)? (Select all that apply) _____
13. What are your main sources of food? _____
14. How often do you experience food shortages? _____

Section C: Gendered Impact of Drought

15. In your household, who is primarily responsible for managing food during drought?

_____

16. Have you had to adjust your meal consumption during drought?

_____

17. If yes, what adjustments were made? (Select all that apply)

_____

18. What coping strategies have you used during drought? (Select all that apply)

_____

19. Who in your household is most affected by food shortages?

_____

Section D: Access to Resources and Adaptation Strategies

20. Do you have access to credit/loans for agricultural activities? _____

21. If no, what are the barriers? (Select all that apply) _____

22. Have you received agricultural extension services or training on climate adaptation?

_____

23. If yes, who provided the training? _____

24. Do you think men and women have equal access to drought adaptation resources?

_____

End of Survey

Thank you for your time and participation. Your responses will contribute to identifying key challenges and solutions for improving gender-sensitive drought resilience strategies in rural food systems.

A3: Focus Group Discussion (FGD) Guide

Introduction:

Thank you for taking part in this discussion. This study aims to explore the gendered impacts of El Niño-induced drought on rural food systems, with a focus on vulnerabilities, coping strategies, and access to adaptation resources. Your input will help inform policies and interventions for better food security outcomes. This discussion will be recorded for analysis, but your identity will remain anonymous.

Discussion Guidelines:

- There are no right or wrong answers; we value all perspectives.
- One person should speak at a time.
- Feel free to share personal experiences relevant to the topic.
- Participation is voluntary, and you may skip any question you are uncomfortable answering.

Section 1: Gender Roles in Agriculture

1. What are the typical roles of men and women in agriculture within your community?
2. How do traditional gender roles influence access to land, credit, and farming resources?
3. Are there any differences in the way men and women make farming decisions?

Section 2: Impact of Drought on Rural Households

4. How has drought affected food security in your household and community?
5. Who in your household is most affected by food shortages, and why?
6. Have you noticed any changes in gender roles due to the drought? If so, what are they?

Section 3: Coping Strategies

7. What strategies do men and women use to cope with food shortages during droughts?
8. Have men and women had to migrate in search of income due to drought? If so, how has this affected household dynamics?

9. How effective have community support systems been in addressing food shortages?

Section 4: Access to Resources and Institutional Support

10. Do men and women have equal access to drought adaptation resources, such as training and agricultural support?
11. Have you or others in your community received any assistance from the government, NGOs, or local organizations during drought periods?
12. What challenges do women specifically face in accessing food aid or adaptation programs?

Section 5: Recommendations

13. What do you think should be done to improve food security in drought-affected rural areas?
14. How can gender disparities in agriculture and food security be reduced?
15. What role should government and organizations play in supporting men and women differently during droughts?

Conclusion:

16. Is there anything else you would like to share regarding gender, food security, and drought adaptation?
17. Thank you for your valuable input. Your contributions will help shape more inclusive food security strategies.